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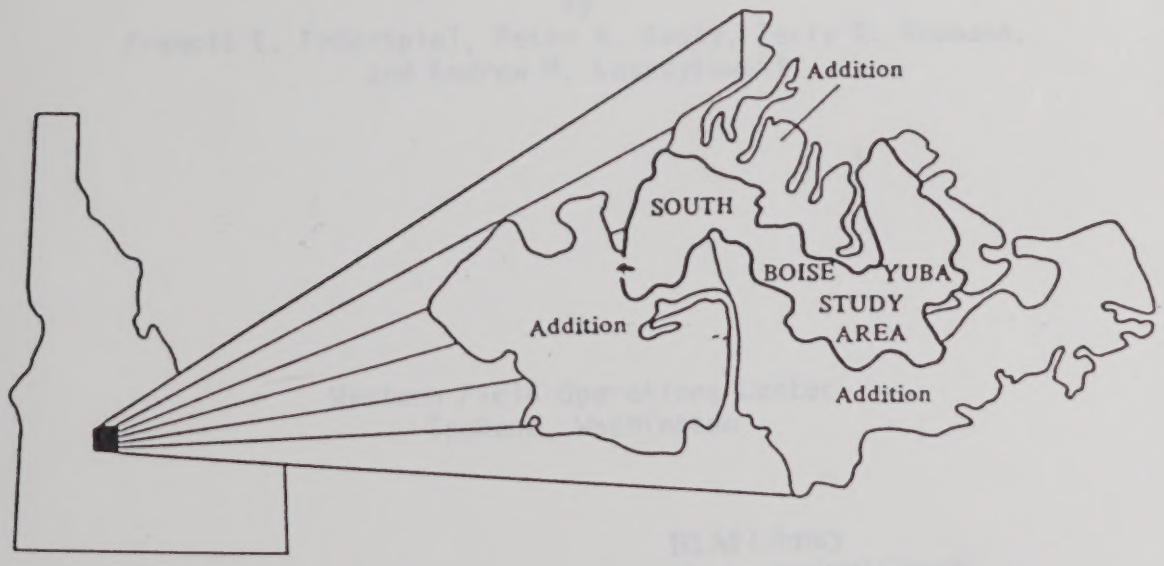
Mineral Resources of the South Boise Yuba Study Area and Additions, Blaine, Camas, and Elmore Counties, Idaho



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UNITED STATES DEPARTMENT OF THE INTERIOR

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MINERAL RESOURCES OF THE SOUTH BOISE YUBA STUDY AREA AND ADDITIONS, BLAINE, CAMAS, AND ELMORE COUNTIES, IDAHO

By
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PREFACE

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Bureau of Mines and U.S. Geological Survey to survey certain areas of Federal lands ". . . to determine the mineral values, if any, that may be present . . . ." Results must be made available to the public and be submitted to the President and the Congress. This report primarily presents the results of a Bureau of Mines mineral survey of the South Boise Yuba study area (I-4553), Camas and Blaine Counties, ID, which was classified as Wilderness Recommended during the Second Roadless Area Review and Evaluation (RARE II) by the Forest Service, January 1979. This report also summarizes information gathered from literature, regarding peripheral lands, including some in Elmore County, added to the original study area after field examinations were completed.

This open-file report contains data gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, East 360 Third Avenue, Spokane, Washington 99202. The report has been edited by members of the Branch of Resource Evaluation at the field center and reviewed at the Division of Mineral Land Assessment, Washington, DC.

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft^3	cubic foot
yd^3	cubic yard
$/$yd^3$	dollar per cubic yard
ft	foot
in.	inch
mi	mile
lb	pound
oz	troy ounce
oz/ton	troy ounce per ton
ppm	part per million
%	percent
tpd	ton per day

SUMMARY

In 1984 and 1985, at the request of the U.S. Forest Service, the U.S. Bureau of Mines examined the 87,720-acre South Boise Yuba study area (formerly known as RARE II Wilderness Recommended area I-4553) to evaluate mineral resources. The study area and additions are in Blaine, Camas, and Elmore Counties, ID, about 60 mi east of Boise.

Granitic rocks of the Cretaceous age Idaho Batholith occupy the western two-thirds of the study area. A Tertiary age granitic complex has intruded, and broken into small blocks, Paleozoic age sedimentary rocks in the eastern third of the study area. Tertiary Challis Volcanics overlie both of these rock types. Principal mineralized structures are gold- and silver-bearing quartz veins and shear zones trending northwest to easterly in the Cretaceous granitic rocks. Copper, lead, and zinc are accessory metals in many mineralized structures.

Lode mines in five nearby gold-silver and silver-base metal mining districts have yielded at least $20 million (historic value) of metal. Production records are not available for properties within the study area, but small amounts of material may have been sent to local mills from as many as six study area lode properties. Minor quantities of gold were probably produced from a placer property within the study area.

Approximately 500 lode and placer claims have been located or relocated in the study area since 1879; 28 unpatented lode and 13 placer claims were current in September 1985. One lode claim is patented. About 150 workings and mineralized outcrops in or near the area were examined during the study; they are grouped into 43 properties.

Four lode properties within or adjacent to the study area contain an estimated 86,500 tons of identified subeconomic gold-silver resources. Resources at those properties range from 5,200 to 47,000 tons, with estimated grades between 0.04 and 0.1 oz/ton gold and as much as 7.7 oz/ton silver. One placer property has 300,000 yd^3 of gravel (100,000 yd^3 within the study area) averaging $1.00/$yd^3$ at a gold price of $400/oz and a gold fineness of 750. Gold, silver, and base-metal content in samples of poorly exposed mineralized structures indicate that further exploration may delineate resources on 14 additional study area lode properties and 4 properties adjacent to the study area borders.

Sand and gravel accumulations in the study area presently are too distant from major markets to be economical, and stone is not suitable for decorative or dimension use. Occurrences of energy minerals have not been identified. There are no mineral, oil and gas, or geothermal leases within the study area and/or additions.

After field examination of the former RARE II area (the study area) was completed in 1985, the U.S. Forest Service requested a mineral inventory of about 260,000 acres of peripheral lands. Published reports and U.S. Bureau of Mines file data reveal that these lands, divided into three additions for this report, include portions of many historically significant mining districts. The north addition takes in most of the Vienna and Sawtooth districts (silver and gold); the southwest addition has parts of the Yuba (Atlanta), Bear Creek, and Skeleton Creek districts (gold and silver); and the southeast addition includes small portions of the Little Smoky, Rosetta, and Warm Spring districts (silver, zinc, lead, and copper). Mineral ore deposits in the north and southwest additions are mainly shear zones and fissure-filled veins cutting granitic rocks of the Idaho Batholith. Deposits in the southeast addition usually occur as fracture fillings and replacements in sedimentary rocks near granitic rock contacts.

In September 1985, there were 32 patented lode and placer claims and about 300 unpatented lode and placer claims current in or adjacent to the three additions. There may be numerous old, unreported prospects. Field examinations would be necessary to evaluate resources within the three additions.

INTRODUCTION

This report describes the USBM (U.S. Bureau of Mines) study to evaluate mineral resources of the South Boise Yuba study area at the request of the USFS (U.S. Forest Service). The USBM examined individual mines, prospects, claims, and mineralized zones, and evaluated identified mineral and energy resources. Results of the investigations will be used to help determine the suitability of the study area for inclusion into the National Wilderness Preservation System. Although the immediate goal of this and other USBM mineral surveys is to provide data for the President, Congress, government agencies, and the public for land-use decisions, the long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

After the USBM completed field examinations of the study area, formerly known as the South Boise Yuba RARE II Wilderness Recommendation, the USFS requested a mineral study of approximately 260,000 acres of additional lands peripheral to the study area. These lands were inventoried for mineral value by the USBM in a review of available published information and file data; however, no field examinations were conducted. Appendices A and B include data and evaluations of properties in and adjacent to the study area; data on properties occurring in and adjacent to study area additions are tabulated in appendix C.

Setting

The South Boise Yuba study area encompasses 87,720 acres, and later additions total about 260,000 acres. These lands are administered by the USFS. The area is in south-central Idaho, approximately 60 mi east of Boise and 80 mi north of Twin Falls (fig. 1). Access to area borders is by graveled and unmaintained roads from U.S. Highway 20 and Idaho State Highway 75. Pack trails follow major drainages and some ridges in the area. Heavy annual snowfall, locally over 100 in., usually restricts travel from November to June. Branches of the Union Pacific Railroad serve Ketchum and Fairfield.

The area is near the southern flank of the Sawtooth Range, which includes the Smoky Mountains, and is part of the northern Rocky Mountain Geomorphic Province (Thornbury, 1965, p. 384-386). Physiography is characterized by dendritic drainages, sprawling mountains, and nonlinear topography (fig. 2). Numerous ridges exceed 9,000 ft in elevation, and well-preserved alpine glacial features are prominent. Elevations range from 10,336 ft on Norton Peak to 5,200 ft near the southwest corner of the southwest addition (pl. 1). Local relief is typically 1,500 to 2,000 ft per mile. Lodgepole pine and fir are the dominant trees, and sagebrush and bunch grasses cover many south- and west-facing mountain slopes.

Previous Studies

Studies of mining districts near the South Boise Yuba study area, and its additions, include descriptions of geology, mineral deposits, mining, and milling. Most notable are reports by Clayton (1877), Anderson (1939, 1943), Wagner (1939), and Taylor (1986) on the Atlanta and Bear Creek (Rocky Bar) districts; Ross (1927) and Shannon (1963) on the Vienna district; and Lindgren (1900) and Ross (1930, 1931, 1941) on various districts in the region. Reports prepared by USGS (U.S. Geological Survey) and USBM personnel on the mineral resources and mineral potential of nearby wilderness areas include: Kiilsgaard and others (1970), Simons and others (1981), and Tschanz and others (1986). Regional geologic studies which cover segments of the study area and additions were by Umpleby (1915), Umpleby and Livingston (1920), Ballard (1928), Larsen and Schmidt (1958), Barnes (1962), Ross (1962, 1963), Reid (1963), Hall and others (1978), Hamilton (1962), Gehlen (1983), Taylor (1986), and Good (1986). Rember and Bennett (1979) compiled a geologic map of the Hailey 2^{o} quadrangle, and Hustedde and others (1981) compiled information on mines and prospects, and designated mining districts, in the quadrangle. The region including the study area and additions was evaluated during the Department of Energy NURE (National Uranium Resource Evaluation) study of the Hailey, Idaho Falls, Elk City, and Boise 1^{o} by 2^{o} quadrangles (Jones and Fay, 1982).

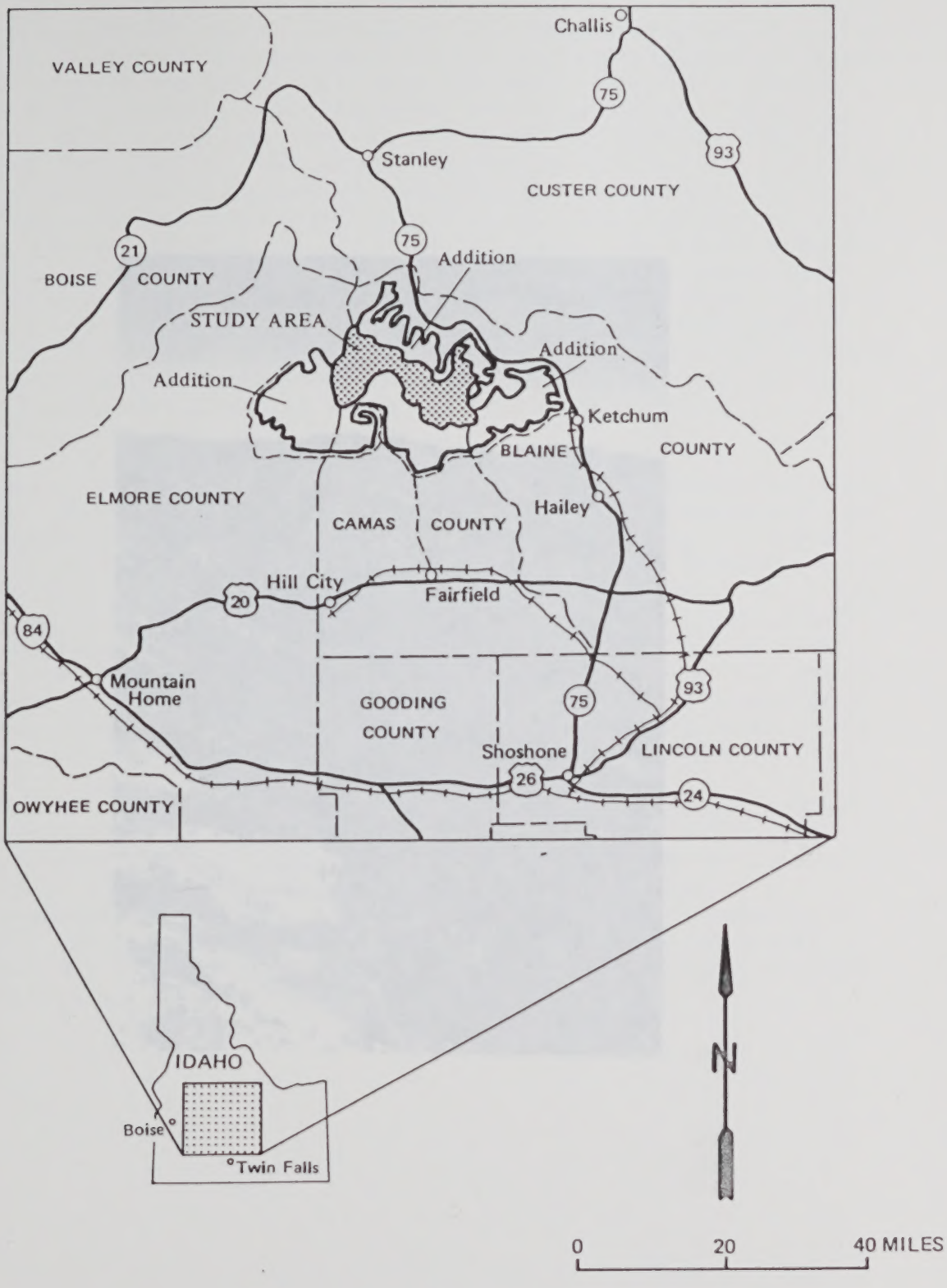


FIGURE 1.– Location of the South Boise Yuba study area (I-4553) and additions, Blaine, Camas, and Elmore Counties, ID

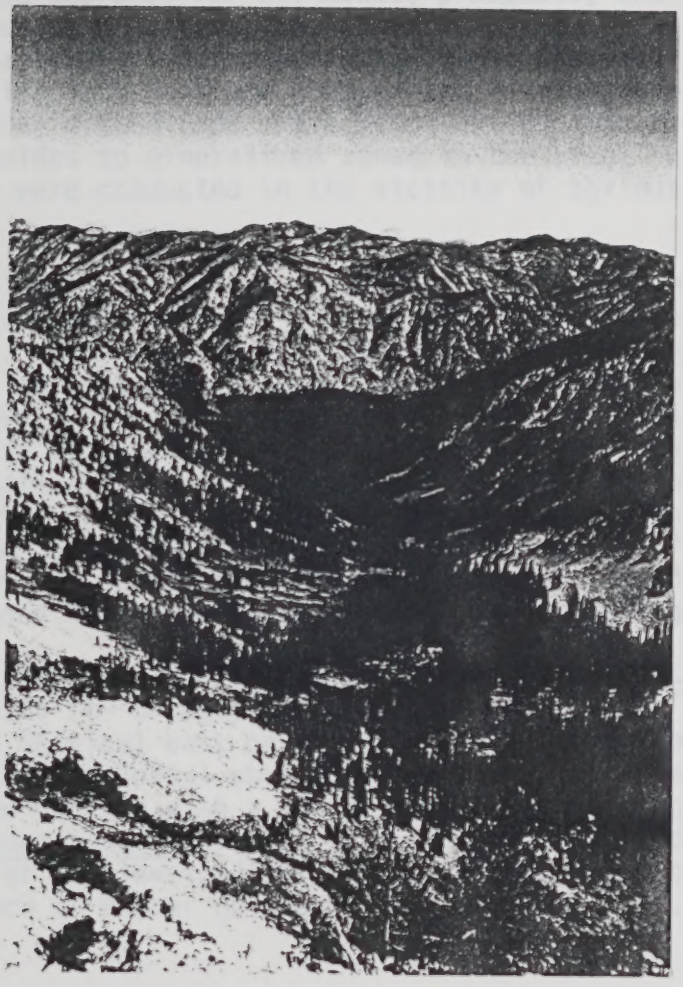


Figure 2.--View north down the U-shaped valley of South Fork of Ross Fork. Note the typical nonlinear ridges of the region.

Present Study

Work by the USBM on the South Boise Yuba study area entailed prefield, field, and report prepartion phases. Prefield studies included library research and perusal of Blaine and Camas County claim records, and BLM (U.S. Bureau of Land Management) mining and mineral lease records. USBM, state, and other production records were searched and pertinent data compiled. An attempt was made to contact claim owners and lessees for permission to examine properties and publish the results. In some cases, they accompanied the authors to the mineral property. Field studies involved searches for all mines, prospects, and claims indicated by prefield studies to be within or near the study area. Those found were examined and, where warranted, mapped and sampled. Mines and prospects outside, but near the study area, also were investigated to determine whether mineralized zones might extend into the study area and to establish guides to mineralized zones in the area. Ground and air reconnaissance were conducted in the vicinity of obvious rock alteration.

Samples collected at mines, prospects, claims, and mineralized sites included 315 rock, 138 alluvial (108 channel and 30 reconnaissance), and 5 petrographic. Rock samples were of four types: 1) chip - a regular series of rock chips taken in a continuous line across a mineralized zone or other exposure; 2) random chip - an unsystematic series of chips taken from an exposure of apparently homogeneous rock; 3) grab - rock pieces taken unsystematically from a mine waste dump, stockpile, or of float (loose rock lying on the ground); and 4) select - pieces of rock chosen, generally, from the apparently best mineralized parts of a stockpile or exposure, or of any particular fraction (e.g., quartz host rock). Chip samples were used for estimates of tonnage and average grade.

Alluvial (placer) samples were of two main types. Channel samples were usually 0.25 ft^3 of material per linear foot taken continuously down a cleaned vertical bank or pit wall and concentrated in a sluice box. Large volume alluvial channel samples were also taken by a tractor-mounted backhoe with a 30-in.-wide bucket having a capacity of 0.67 yd^3. Reconnaissance samples were of surficial sand and gravel, generally one or two level 14-in. panfuls concentrated on site to check for the presence of placer gold or other heavy minerals.

Most rock samples were analyzed at the USBM Research Center in Reno, NV; however, 65 samples were analyzed by Chemex Labs, Ltd, Sparks, NV. Rock samples sent to the Reno Research Center were fire-assayed for gold and silver. Presence and abundance of other identified or suspected elements of possible economic significance were determined by atomic absorption, colorimetric and radiometric methods, or x-ray fluorescence. Typically, at least one sample from each locality was analyzed for 40 elements 1/ by semiquantitative methods to detect unexpected elements of possible significance. Samples appearing to contain anomalous concentrations were reanalyzed by quantitative methods. Samples sent to Chemex Labs were fire assayed for gold. Silver was determined by atomic absorption or fire-assay, and 23 elements 2/ were analyzed by the ICP (inductively coupled plasma) method. Petrographic examinations by the Reno Research Center and the USGS were performed to identify selected rock suites, alteration types, and mineral assemblages.

Alluvial samples, partially concentrated in the field, were further concentrated in Spokane on a laboratory-size Wilfley table. Resulting heavy mineral fractions were scanned with a binocular microscope to determine heavy mineral content. When gold was detected, larger particles were hand-picked and weighed along with fine gold recovered by amalgamation. Concentrates were also checked for radioactivity and fluoresence.

Complete analyses of samples are on file at the USBM Western Field Operations Center, E. 360 Third Avenue, Spokane, WA 99202.

1/ Aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, gallium, gold, iron, lanthanum, lead, lithium, magnesium, manganese, molybdenum, nickel, niobium, palladium, phosphorus, platinum, potassium, scandium, silicon, silver, sodium, strontium, tellurium, thallium, tin, titanium, vanadium, yttrium, zinc, and zirconium.

2/ Aluminum, barium, beryllium, bismuth, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, phosphorus, potassium, sodium, strontium, titanium, tungsten, vanadium, and zinc.

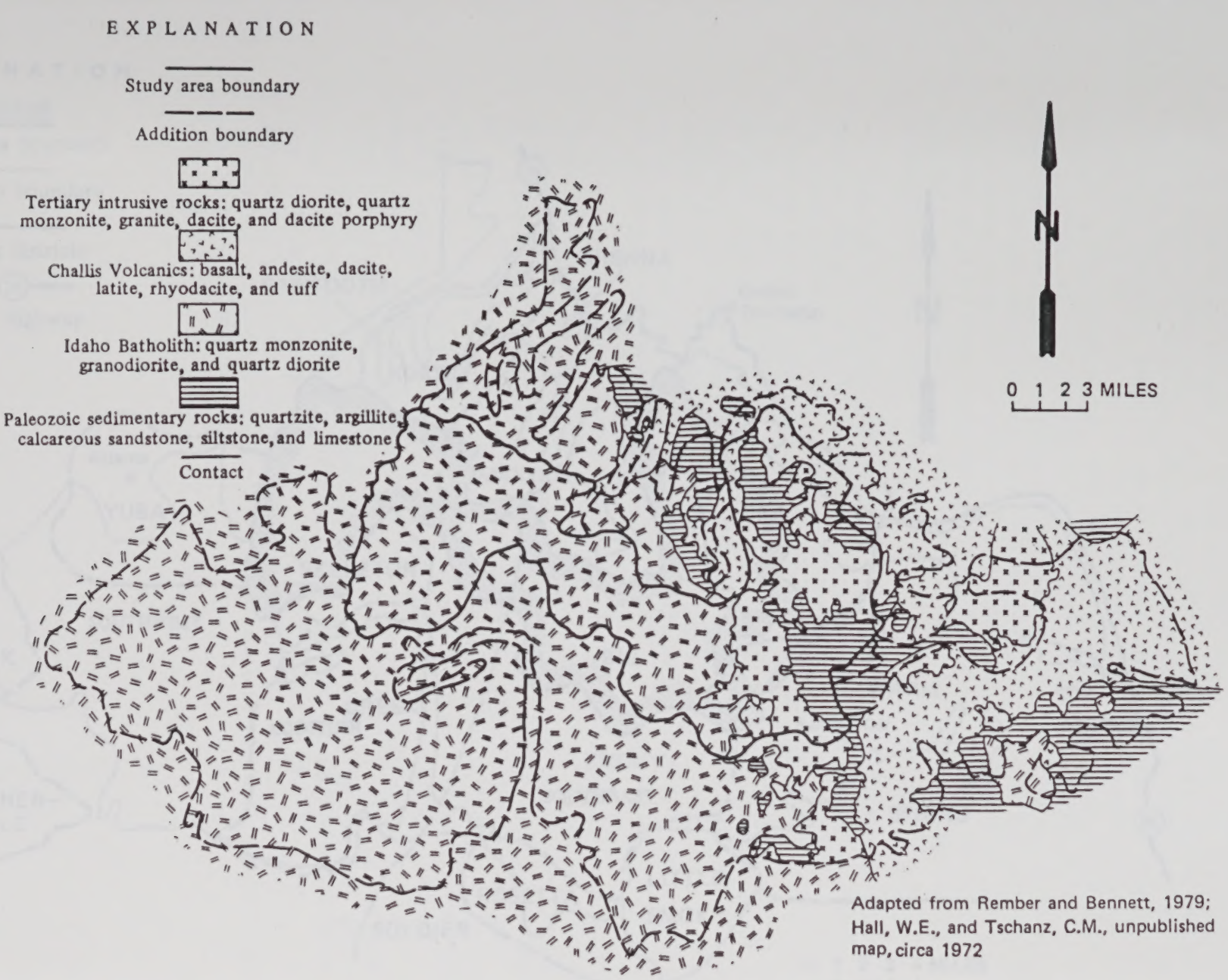
ACKNOWLEDGEMENTS

The authors extend a special thanks to mine operators and claimants who provided background information and data on their properties. In particular, Richard Day, Thornly Williams, Sr., Terry and Neil Platts, Marvin Johnson, Edward and Leroy Strout, Thomas Eskridge, and Phillip Cash were extremely helpful. USFS personnel John Madden, Keith Walker (retired), Brandt "Buzz" Vanskike, and Jeff Jones made available aerial photographs, claim data, and road and trail access information. Dale Avery and Richard Winters, USBM geologists, assisted in field examinations of mining properties in 1984. Field assistants in 1984 who greatly expediated the survey were Nancy Logue, Dominic Winslow, Brian Ballou, and Vince Vandenbosch; Logue also assisted with field examinations in 1985 and data assembly in 1984 and 1985.

GEOLOGIC SETTING

The South Boise Yuba study area and additions are on the southern flank of the Sawtooth Range and include the Smoky Mountains. Exposed in this region are granitic rocks (quartz monzonite and granodiorite) of the Cretaceous age Idaho Batholith, sedimentary rocks (quartzite, sandstone, and limestone) of the Paleozoic age Wood River and Dollarhide Formation, intrusive rocks (pink granite, granodiorite, dacite porphyry) of Tertiary age, and andesite and basalt of the Tertiary Challis Volcanics (fig. 3). Accumulations of sand and gravel, commonly of glaciofluvial origin, occur along major drainages (Rember and Bennett, 1979; Hall and others, 1974, p. 89-95).

Quartz monzonite and granodiorite of the Idaho Batholith occupy the western part of the study area and the southwest addition and most of the north addition including Skeleton Creek, Yuba, Bear Creek, Sawtooth, and Vienna mining districts (fig. 4). These rocks are cut locally by silicic and mafic dikes and are overlain in places by volcanic rocks. Mineralized structures in the study area are dominantly 1- to 5-ft-thick, gold-bearing quartz veins, generally with silver and accessory base metals, that have filled fissures or replaced sheared and altered granitic rocks. Wallrock is usually hydrothermally changed to a propylite. Vein minerals are auriferous pyrite (gold-bearing iron sulfide), pyrargyrite (silver antimony sulfide), proustite (silver arsenic sulfide), argentite (silver sulfide), tetrahedrite (copper antimony sulfide), chalcopyrite (copper iron sulfide), galena (lead sulfide), and sphalerite (zinc sulfide). Most study area veins trend northwest, others trend east to slightly north of east; dips are usually 50^{o} or more. Alluvium is composed mainly of glacial material that has been moderately sorted, locally. Placer gold concentrations are generally low and widespread but constitute resources at only one property.


EXPLANATION
Study area boundary
Addition boundary
Tertiary intrusive rocks: quartz diorite, quartz monzonite, granite, dacite, and dacite porphyry
Challis Volcanics: basalt, andesite, dacite, latite, rhyodacite, and tuff
Idaho Batholith: quartz monzonite, granodiorite, and quartz diorite
Paleozoic sedimentary rocks: quartzite, argillite, calcareous sandstone, siltstone, and limestone
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Adapted from Rember and Bennett, 1979; Hall, W.E., and Tschanz, C.M., unpublished map, circa 1972

FIGURE 3.– Geologic map of the South Boise Yuba study area and additions

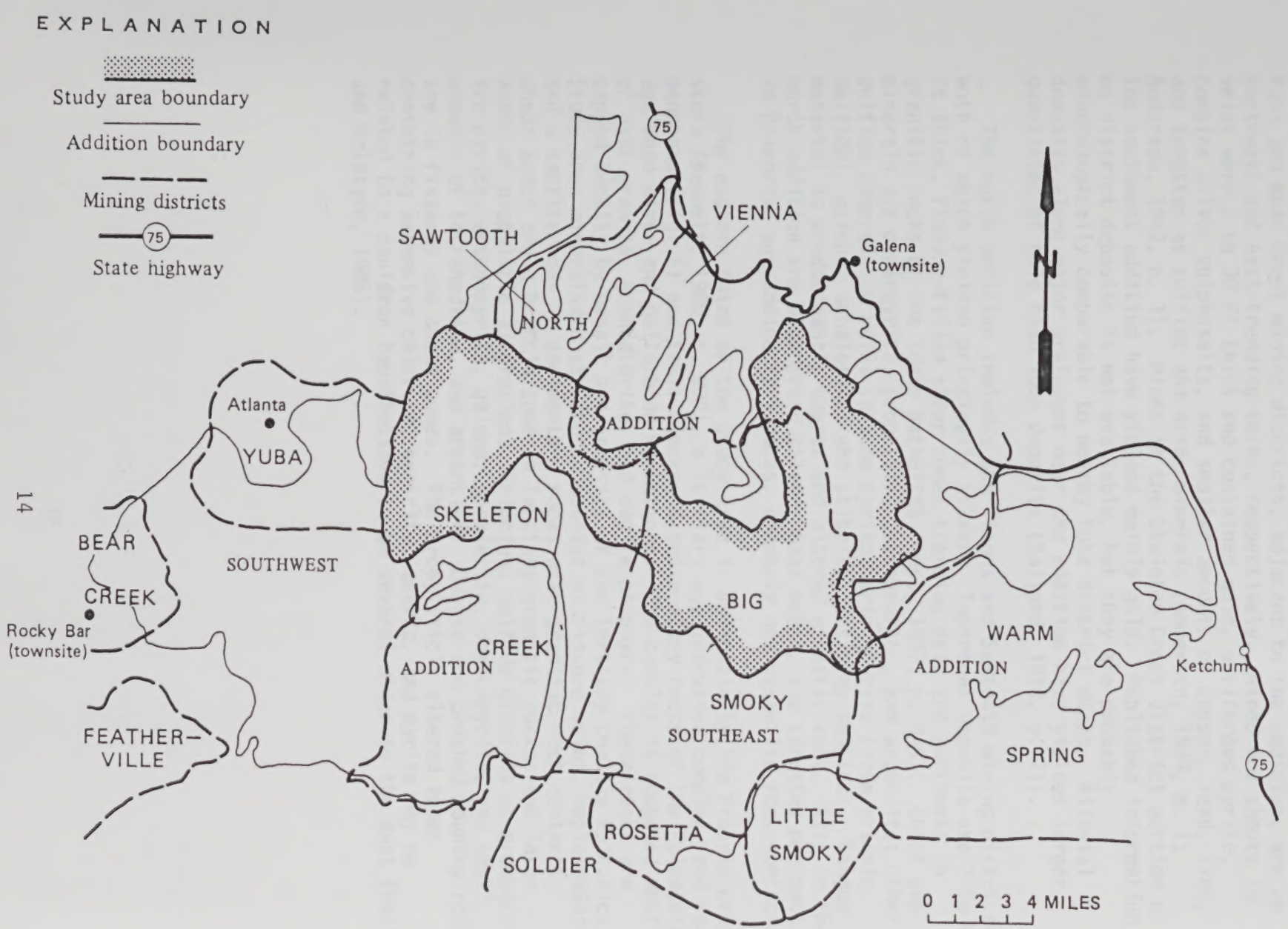


FIGURE 4.– Index map of mining districts in and near the South Boise Yuba study area and additions

In and near the southwest addition, gold, silver, accessory base metals, and tungsten are in fissure-filled quartz veins in granitic rocks of the Idaho Batholith, usually near younger age dikes. Mines in the Yuba and Bear Creek mining districts, adjacent to the addition, are on northeast and east-trending veins, respectively. Mined ore shoots in veins were 2 to 30 ft thick and contained gold, auriferous pyrite, complex silver sulphosalts, and smaller amounts of copper, lead, zinc, and tungsten as sulfide and oxide minerals (Anderson, 1939, p. 1; Anderson, 1943, p. 1). Mines in the Skeleton Creek district portion of the southwest addition have yielded mainly gold. Published information on district deposits is not available, but they are probably mineralogically comparable to nearby Yuba district mines. Alluvial deposits along major drainages near the addition have yielded larger quantities of gold than lode deposits (Ballard, 1928, p. 11).

The north addition includes the Vienna and Sawtooth mining districts, both of which yielded principally silver. Important deposits are 3 to 4 ft thick, fissure-filled shear zones trending east and northwest in granitic rocks of the Idaho Batholith (Ross, 1927, p. 8-9). Chief ore minerals are pyrargyrite, proustite, tetrahedrite, and argentite; other sulfide minerals in veins include pyrite, arsenopyrite (iron arsenic sulfide), galena, sphalerite, and stibnite (antimony sulfide). Gangue material is predominantly quartz and altered granitic rock. Also in the north addition are widespread silver, base metal, and tungsten prospects in Paleozoic age sedimentary rocks, commonly near granitic rock contacts.

The eastern third of the study area is underlain by the Prairie Creek stock (Bennett, 1980, p. 280), a Tertiary age intrusive complex, and roof pendants (fig. 5) and fault blocks of sedimentary rocks of the Paleozoic age Wood River and Dollarhide Formations. The complex is composed mostly of pink granite, granodiorite, and dacite porphyry. These rocks are capped locally by basalt and andesite of the Tertiary Challis Volcanics. Study area mineralized structures consist of fissure veins, replacements, and a tactite body in sedimentary rocks near granitic rock contacts; shear zones and a breccia zone in Tertiary granitic rocks; and large zones of propylitic alteration. Principal sulfide minerals at prospects are pyrite, arsenopyrite, galena, sphalerite, chalcopyrite, and small amounts of tetrahedrite, and argentite. Quartz and crushed country rock are in fissures and shear zones. The propyliticly altered zones containing extensive chlorite, sericite, quartz, and pyrite may be related to a cauldron hypothesized to be several miles to the east (Hall and McIntyre, 1986).

Figure 5.--View of a pendant of Paleozoic sedimentary rocks (argillite) overlying granitic rocks of the Tertiary Prairie Creek stock, southeast from above Prairie Lakes.

Deposits of silver-lead-zinc occur adjacent to the southeast addition in the Little Smoky, Rosetta, and Warm Spring mining districts (fig. 4). Most deposits are fissure veins and tabular replacements along shear zones in Paleozoic sedimentary rocks (Wood River and Dollarhide Formations) near granitic rocks of the Idaho Batholith (Umpleby, 1915, p. 235; Hall and others, 1974, p. 90-95). Ore minerals are argentiferous galena (silver-bearing lead sulfide), tetrahedrite, and sphalerite in a quartz-siderite or quartz-calcite gangue. Mineralized structures commonly trend northeast with steep dips to the northwest or southeast. Challis Volcanics mask large areas of Tertiary intrusive and Paleozoic sedimentary rocks in the east half of the southeast addition. The volcanic rocks are part of the cauldron described by Hall and McIntyre (1986).

MINING HISTORY AND PRODUCTION

The mining history and current activity for the study area and the three additions are discussed separately. Sources of study area history are county mining claim records; field examinations, including claimaint information; BLM claim recordation files; USBM production records and property file data; and published information. The two latter sources also provided information on the mining history of the additions.

Study Area History

The first mining claims recorded in the study area were in 1879 following discoveries at nearby gold-silver mining camps. Since then, Blaine and Camas County claim records show that about 450 lode and 50 placer claims and relocations were recorded, most in the west half of the area. Principal recording periods were 1879 to 1899, 1908 to 1915, and 1931 to 1942. In September 1985, BLM records indicated that 28 lode and 13 placer claims were current. The Diamond Prince Claim (fig. 6, no. 26) was patented in 1906. All current and most historic claims were in the northern part of the Skeleton Creek mining district according to Hustedde and others (1981). Claims are not held in the Big Smoky mining district portion of the study area. Early county records of claims in the study area also referenced the Vienna, Sawtooth, Rosetta, South Boise, Galena, and Little Smoky mining districts.

Mines, prospects, and claims

1. This Is It claims
2. Pilot Knob prospect
3. Cliff prospect
4. Cumberland prospect
5. Lee prospect
6. Rex prospect
7. Ibex prospect
8. Gold Run Creek prospect
9. John L placer claims
10. Old Ironsides claim
11. Ross nos. 1-10 placer claims
12. Little Bear Creek prospect
13. Perkons Lake prospect
14. Tip Top mine
15. Unnamed prospect
16. Red Cloud prospect
17. Crown Point prospect
18. Kansas prospect
19. Lonely Man prospect
20. Bret Hart prospect
21. Baltic prospect
22. Silver Shield prospect
23. Golden Dawn prospect
24. Ivanhoe prospect
25. Windsor prospect
26. Diamond Prince claim (patented)
27. Silver Leaf nos. 1-3 claims
28. Commonwealth prospect
29. Last Chance prospect
30. Raymond and Aurora claim groups
31. Emma Creek prospect
32. Crystal Clear placer claim
33. Mountain King mine
34. Hill Side prospect
35. Susan prospect
36. Oh Cash prospect
37. I.O.U. prospect
38. Newman Creek prospect
39. Unnamed prospect
40. Apollo Creek prospect
41. Unnamed prospect
42. Baker Peak prospect
43. Horsesnoe prospect

FIGURE 6. – Mines, prospects, claims and mineralized sites in and near the South Boise Yuba study area

Workings on known lode properties examined during this investigation included 15 open adits, 17 inaccessible adits, 12 shafts, and 105 prospect pits and trenches. Open adits were generally less than 100 ft long; shafts were less than 15 ft deep; and surface workings were typically shallow, 15 to 20 ft long, and 5 to 10 ft wide. The poor conditions of the workings and dilapidated ruins indicate most mining-related activity occurred from the early 1900's through the depression years (1930's). In 1985, an adit was being extended on the Raymond and Aurora claim groups (fig. 6, no. 30), and small-scale development provided test material for a mill at the Tip Top mine (fig. 6, no. 14). Lode workings on the Silver Leaf nos. 1-3, Mountain King, Diamond Prince, Pilot Knob, Ibex, and Susan properties (fig. 6, nos. 27, 33, 26, 2, 7, and 35) may have yielded small quantities of material which were treated at historic mills in the Vienna, Sawtooth, Atlanta, or Bear Creek mining districts or smelters at Galena (townsite) or Ketchum.

Placer mining activity was mainly along lower Ross Fork; a few claims were located on Johnson and Emma Creeks and the West Fork of Big Smoky Creek. Claims were originally located along lower Ross Fork in 1902. Relocations were recorded in 1931-1940, 1946, and 1950, and the current Ross nos. 1-10 claims (fig. 6, no. 11) were recorded in 1980. A hydraulicked pit and adjacent ground-sluice trenches covering about 0.3 acre, 18 pits and trenches, and one flooded shaft were excavated on the Ross claims, mostly before 1940. Production records are not available, but, based on the sample analyses and size of excavations, an estimated 20 oz of placer gold were produced.

Except for the mineralized structure being explored by underground methods at the Raymond and Aurora claim groups, study area mining activity in 1985 was limited to annual assessment work.

Mining History of Additions to the Study Area

The three additions include portions of several significant past-producing mining districts. The north addition includes most of the Vienna and Sawtooth districts (fig. 4). The southwest addition is overlapped by the Yuba (Atlanta), Bear Creek (Rocky Bar, Spanish Town), and Skeleton Creek districts; the Featherville district is nearby. The southeast addition includes most of the Big Smoky district and parts of the Little Smoky, Rosetta, and Warm Spring districts.

In the early 1860's, placer gold was discovered first in the Yuba district and then later that same period in the Bear Creek district near the southwest addition (Ballard, 1928, p. 1). Production records show these districts yielded at least $6 million and $7 million, respectively, of gold and silver from lode mines, mainly from 1875 to 1885, 1906 to 1911, and 1932 to 1938 (Anderson, 1939, p. 21; USBM production records). Total production is probably considerably higher. Records for lode mines are incomplete prior to 1901, when significant activity occurred, and placer gold production is reputed to far exceed lode output (Ballard, 1928, p. 11). Principal Yuba mining district mines, located along the Atlanta lode (pl. 1, no. 74), were the Boise-Rochester, Monarch, Buffalo, and Talache. Production from each of these mines was valued at from $1 million to more than $2.5 million (Anderson, 1939, p. 47, 55, 58; USBM production records). Important Bear Creek district mines, with production values similar to the mines at Atlanta, were the Ada Elmore, Ophir, Pittsburgh, and Vishnu (Ballard, 1928, p. 25, 27; Anderson, 1939, p. 14, 26). Gold dredging was the chief activity in the Featherville district between 1922 and 1927 during which 33,000 oz were produced (Ross, 1941, p. 48).

Skeleton Creek mining district lode mines within the southwest addition have produced more than 5,000 oz of gold; 3,000 oz of silver; 8,000 lb of lead; and 100 lb of copper since 1901. Over 90 percent was from the El Oro and Red Horse mines (pl. 1, nos. 95 and 94). The Axoloti mine, also inside the addition, accounted for 18.56 oz of gold and 3 oz of silver.

BLM claim recordations as of September 1985 revealed that 112 unpatented lode and 14 placer claims were current in and along the boundary of the southwest addition. There are also five patented lode claims.

In 1985, mining-related activity in or near the southwest addition included diamond drilling, placer mining, exploration of known structures, claim staking, and assessment work. At Atlanta, diamond drilling by a Canadian firm delineated a disseminated gold deposit (pl. 1, no. 75). West of the addition near Rocky Bar townsite (pl. 1), two companies were placer mining, and another company was preparing drill roads. At historic Spanish Town (pl. 1, no. 85), a hillside placer deposit was being mined by hydraulic methods. Along Bear Creek, on the east side of the addition, mineralized structures at the Tip Top and Red Horse mines were being explored by underground methods.

Silver ore was discovered in the Vienna and Sawtooth districts, north addition, in 1879 (Umpleby, 1915, p. 247). Vienna district mines, namely the Webfoot (Mountain King) and Vienna (pl. 1, nos. 63 and 64), produced extensively until 1884. Sawtooth district mines, principally the Silver King (pl. 1, no. 54), continued to yield ore through 1888 (Umpleby, 1915, p. 247, 249). Production records are fragmentary for the early days of the districts, but Umpleby (1915, p. 247, 249) estimated that each district had produced ore worth $1 million by 1915. Recorded production for both districts from 1915 to 1977 totaled 5,044 tons of ore containing 84,962 oz of silver, 927 oz of gold, 96,448 lb of lead, and 1,967 lb of zinc (USBM production records).

BLM records of September 1985 show 82 unpatented lode claims were held in the north addition or adjacent to its borders. Twenty-seven patented lode claims are in the addition or touch the borders, mainly in blocks along upper Smiley and Beaver Creeks (fig. 6). Mining activity in 1985 consisted of assessment work and exploration of known veins.

There has been little recent mining activity within the southeast addition, although districts adjacent to its southern boundary were once active mining centers. Discoveries of silver-lead-zinc deposits near Dollarhide Peak and Boyle Mountains in 1880 led to establishment of the Rosetta, Big and Little Smoky, and Warm Spring mining districts (fig. 4). Peak production years for the districts were 1881 to 1887 (Ross, 1930, p. 19). Subsequent production occurred sporadically until 1983 (USBM production records). Lode mines in the Rosetta district, particularly the Carrie Leonard and King of the West (pl. 1, nos. 108 and 106) and, in the addition portion of the Warm Spring district, the Old Ontario and Lucky Boy mines (pl. 1, nos. 119 and 120), produced silver-lead-zinc ore valued at about $2 million (Umpleby, 1915, p. 234; Ross, 1930 p. 19). Records from the Big and Little Smoky districts are fragmentary, but output is estimated to have been about $0.5 million from silver and base-metal deposits. In 1986 a 100-ton per day custom flotation mill along Warm Springs Creek south of the addition was making a gold-silver concentrate from ore mined south of the study area. This mill also produced a base metal and barite concentrate in earlier years.

As of September 1985, 74 lode and 12 placer claims were current within or contiguous to the southeast addition. However, activity was primarily assessment work. Presently, seven patented claims occur within 1 mi of the southern border of the addition; and one is in the addition.

COMMODITY HIGHLIGHTS

Gold, silver, copper, lead, zinc, and tungsten are the chief mineral commodities that have been produced in and near the South Boise Yuba study area and the three additions. Identified resources are currently subeconomic (appendix D). Applicable mining methods considered for these resources include underground methods for high-value, small-tonnage, hard rock deposits, and surface methods for placer deposits and low-grade, high-tonnage hard rock deposits. Production costs are influenced greatly by deposit accessibility, size and depth, and amenability to metallurgical processing. Other important considerations affecting resource values of commodities are market conditions and in some cases, dependence on foreign sources. Table 1 summarizes domestic mine production and consumption, import sources and reliance, commodity prices, and uses of those mineral commodities found in and near the study area.

TABLE 1.--U.S. summary of commodities found in the South Boise Yuba study area and additions
(Commodity statistics are from U.S. Bureau of Mines Mineral Commodity Summaries - 1987)

Commodity	Domestic mine production, 1986 (000) 1/	Apparent consumption, 1986 (000)	Units	Major import sources	Net import reliance, 1986 2/ (percent)	Average 1986 domestic price (dollars)	Price unit	Major uses
Gold	3,600	3,300	Troy ounce	Canada Uraguay Switzerland	21	$369.00	Troy ounce	Jewelry and arts, industrial (mainly electronic), dental, and small bars (investment)
Silver	35,000	168,000	Troy ounce	Canada Mexico United Kingdom Peru	69	5.40	Troy ounce	Photography, electrical and electronic products, sterling ware, electroplated ware, jewelry, brazing alloys and solders
Lead	350	1,100	Metric 3/ tons	Canada Mexico Peru Australia	20	.22	Pound	Batteries, gasoline additives, construction, electrical, TV glass, paint, ceramics, ballasts, tubes, containers, type metal
Zinc	190	1,022	do-----	Canada Mexico Peru	74	.38	do-----	Construction materials, transportation, machinery, electrical
Copper	1,170	2,170	do-----	Chile Canada Peru Mexico	27	.663	do-----	Building construction, electrical and electronic products, industrial machinery and equipment, transportation
Cadmium 4/	1.3	4.1	do-----	Canada Australia Mexico West Germany	69	1.25	do-----	Coating and plating, batteries, pigments, plastics, and synthetic products
Tungsten	.8	6.0	do-----	Canada China Bolivia Portugal	62	47.00	Metric ton unit (7.93 kilograms 5/ tungsten)	Metalworking, mining and construction machinery and equipment, lamps and lighting, electrical machinery and equipment

1/ Estimated
2/ Defined as imports - exports plus adjustments for government and industry stock changes.
3/ Metric ton = 1.10 short tons
4/ Produced mainly as a byproduct of zinc mines.
5/ Kilograms = 2.20 lbs.

MINES, PROSPECTS, CLAIMS, AND MINERALIZED SITES

Forty-three properties examined during the 1984-1985 field study, as well as known properties in or near the three additions, are shown on plate 1 and on figures 6 and 8-11. This section of the report divides the study area (the RARE II area) into the Skeleton Creek mining district on the west and the Big Smoky mining district on the east. Lode mines, prospects, and claims described are mostly on structurally controlled, gold- and silver-bearing quartz veins and shear zones in granitic rocks of the Idaho Batholith in the Skeleton Creek district. One district placer property is described in detail. In the Big Smoky district, quartz veins and shear zones occur in Tertiary age granitic rocks as well as a tactite and replacement body in sedimentary rocks. Major mineral properties examined during the field study are described in detail in appendix A; data on minor or less well exposed properties examined in the study area are summarized in appendix B. Lands added to this study after completion of the field work are divided into three geographical additions--north, southwest, and southeast. Properties in or near these additions with adequate information from literature sources or USBM files, or which appear on source maps are summarized in appendix C.

Skeleton Creek Mining District

The western half of the study area occupies the northern part of the Skeleton Creek mining district (fig. 4). Access in the area is by pack trails from secondary roads leading to its borders. There is no recorded production, but small quantities of gold- and silver-bearing material may have been removed from four lode properties within the study area. One placer property may have yielded gold. USBM records for the Tip Top mine, adjacent to the southern border, show that 58 oz of gold and 18 oz of silver were produced from 1939 to 1941. The current owner indicated that small amounts of gold and silver also were mined prior to 1939 (R. Day, oral commun., 1985).

Since 1879, about 350 claims (300 lode and 50 placer) have been recorded for the Skeleton Creek district portion of the study area. In 1985, 28 lode and 13 placer claims were current. A patent is held for the Diamond Prince claim. Hard rock workings which were examined include 11 open adits (27 to 260 ft long), 9 inaccessible adits (estimated not to exceed 200 ft in length), 7 shallow shafts, and 66 prospect pits and trenches. Placer developments include a hydraulicked pit, ground-sluice trenches, 18 pits and trenches, and 1 flooded shaft (fig. 7).

In the study area, granitic rocks of the Idaho Batholith host fissure-filled quartz veins and shear zones. Mineralized structures commonly trend northwest or slightly north of east and contain gold, silver, and accessory base-metal minerals. Dominant sulfide minerals are fine- to coarse-grained pyrite, arsenopyrite, galena, argentiferous galena, and sphalerite. Finely disseminated pyrargyrite, argentite, tetrahedrite, and chalcopyrite are in some veins. The precious- and base-metal minerals usually occur in small pods and narrow stringers. Thick alluvial accumulations of poorly to moderately sorted glacial debris (gold-bearing), talus, and alluvial fan material lie along Ross Fork, and lower Johnson and Emma Creeks.

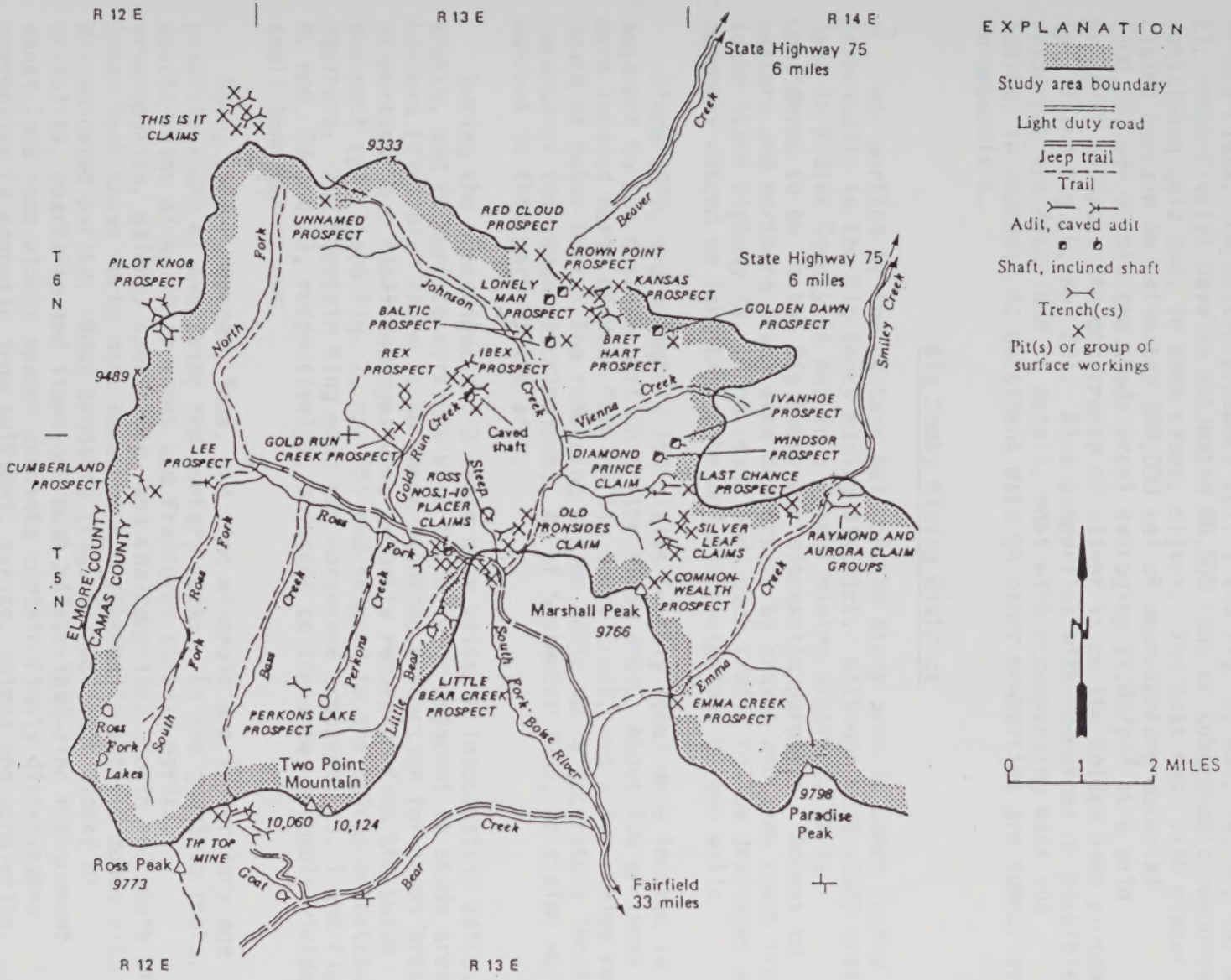


FIGURE 7.– Workings in and near the study area portion of the Skeleton Creek district

The workings examined in the district are clustered into twenty-nine lode and three placer properties (pl. 1 and fig. 7, nos. 1-32). The Tip Top mine (adjacent to the area), Raymond and Aurora claim groups, Diamond Prince claim, and Baltic prospect (pl. 1 and fig. 7, nos. 14, 30, 26, and 21, respectively) have an estimated 86,500 tons of subeconomic resources containing gold and, in some cases, silver. The Ross nos. 1-10 placer claims contain an estimated 300,000 yd^3 of near-surface material (100,000 yd^3 within the study area) averaging \$1.00/yd^3 at a gold price of \$400/oz. An occurrence of silver is on the Golden Dawn prospect (pl. 1 and fig. 6, no. 23). Nine properties with resources or possible resources are described in detail, most with accompanying maps and tables, in appendix A; pertinent data on other properties are summarized in appendix B.

Big Smoky Mining District

That portion of the eastern half of the study area in Camas County is principally in the Big Smoky mining district. Although most study area land in Blaine County is not in a formal mining district, it is considered to be in the Big Smoky for discussion purposes. Access to eastern and northern study area borders is by gravel and jeep roads from Idaho State Highway 75. From roads end, pack trails follow drainages and commonly extend to lake basins headed by precipitous cirque walls.

Since 1879, approximately 150 claims (mostly lode) were located in or adjacent to the eastern portion of the study area. About 100 of these were located north of West Fork of Big Smoky Creek, and a few claims were south of Baker Peak. The remaining claims could no be accurately located because of the vague descriptions. As of September 1985, no claims were current in this part of the area.

During the investigation, 3 short open adits, 8 inaccessible adits, 4 shafts, and 20 surface workings were found in or adjacent to study area borders (fig. 8). There is no known recorded production for study area properties, but small tonnages were probably recovered from the Susan prospect (pl. 1 and fig. 7, no. 35) and shipped to the Galena or Ketchum smelters. The Mountain King mine and Horseshoe prospect (pl. 1 and fig. 8, nos. 33 and 43, respectively), adjacent to the area, probably yielded small tonnages of ore.

Gold, silver, copper, lead, and zinc minerals are in Tertiary age granitic rocks or overlying sedimentary rocks. In the granitic rocks, quartz veins along shear zones and fractures contain pyrite, arsenopyrite, galena, sphalerite, and chalcopyrite. North and south of Baker Peak these rocks host numerous hydrothermally altered zones with disseminated pyrite. Roof pendants (fig. 5) and fault blocks of argillite, quartzite and limestone host silver-lead-zinc replacement zones, and some widely spaced pendants contain finely disseminated pyrrhotite (a magnetic iron sulfide), pyrite, galena and sphalerite. Glaciofluvial gravel accumulations occur along all drainages. Twenty-two alluvial samples taken along Big Smoky Creek and its tributaries contained gold values ranging from nil to \$0.09/yd^3 (at \$400/oz).

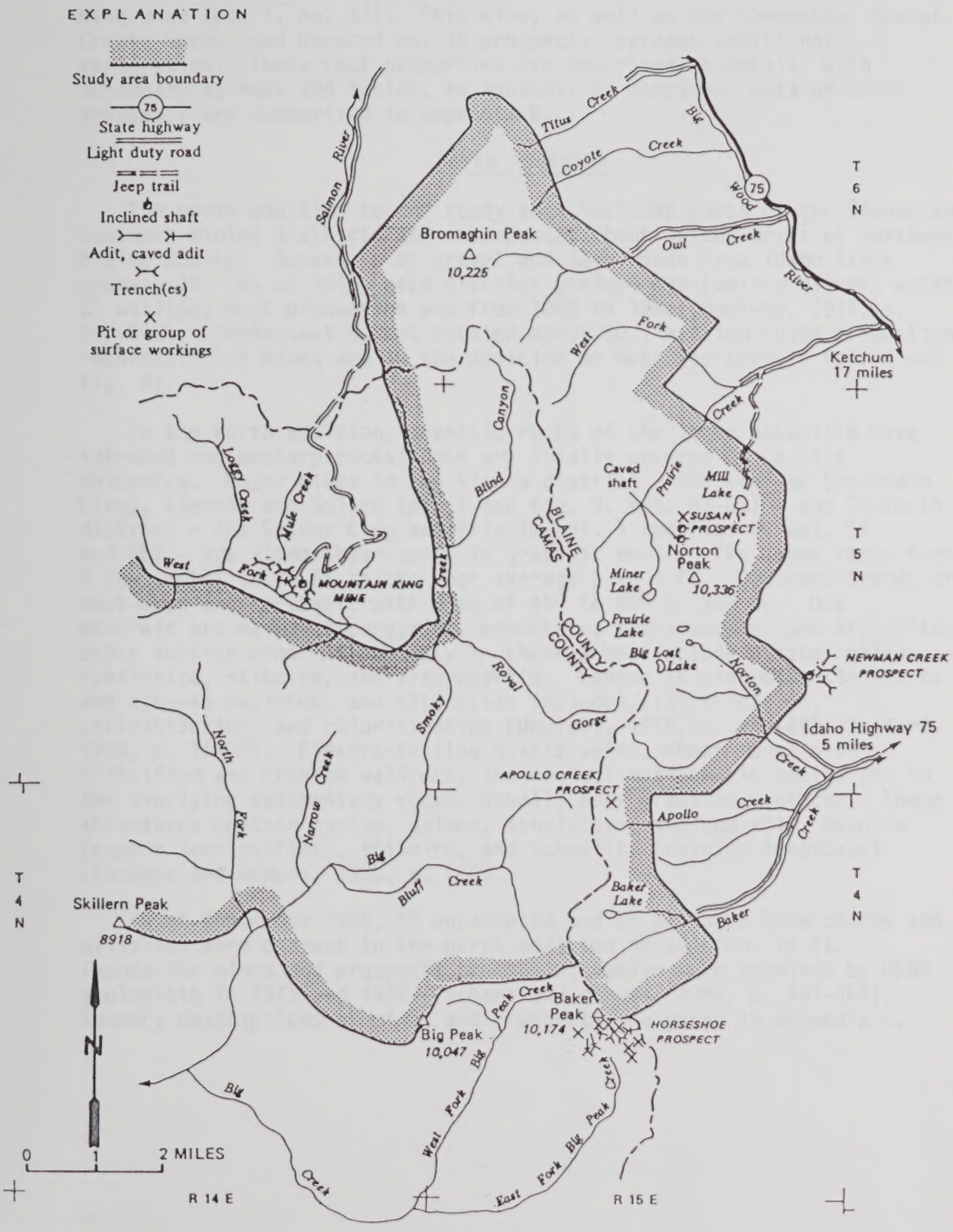


FIGURE 8.– Workings in and near the study area portion of the Big Smoky district

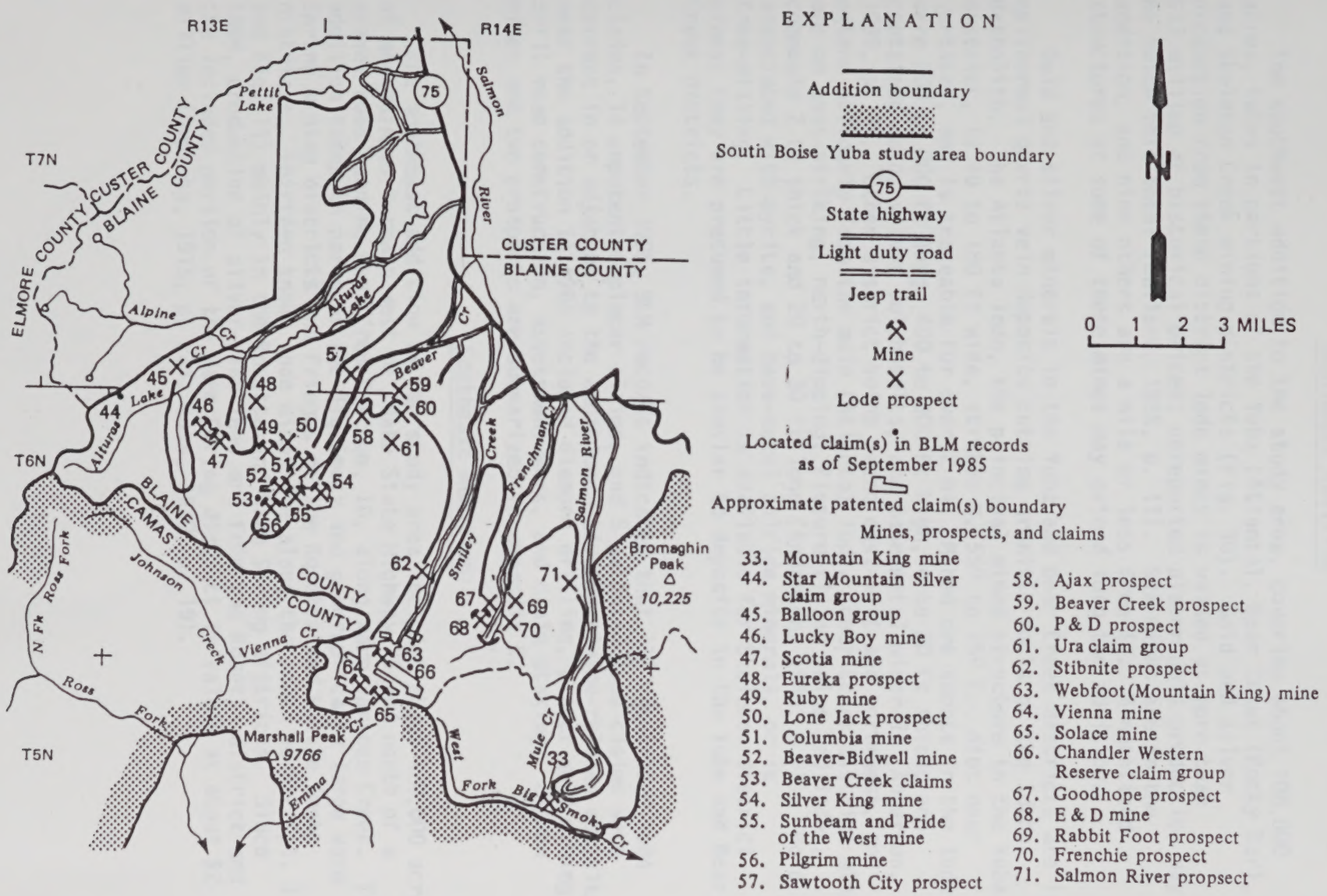
Eleven lode properties in or near this portion of the study area were examined during field surveys (pl. 1 and fig. 6, nos. 33-43). No resources were identified, mainly because of limited exposures; however, a mineral occurrence containing silver, zinc, and lead is on the Mountain King mine (pl. 1, no. 33). This mine, as well as the Horseshoe, Newman Creek, Susan, and Unnamed no. 39 prospects, warrant additional exploration. These four properties are described in detail, with accompanying maps and tables, in appendix A; pertinent data on other prospects are summarized in appendix B.

North Addition

The north addition to the study area includes parts of the Vienna and Sawtooth mining districts and encompasses about 36,000 acres of northwest Blaine County. Access is by gravel and jeep roads from Idaho State Highway 75. As of 1915, each district yielded ore (mainly silver) worth $1 million; most production was from 1880 to 1888 (Umpleby, 1915, p. 247-249). Subsequent output totaled about $0.1 million (USBM production records). Ten mines are in the addition or near its borders (pl. 1 and fig. 9).

In the north addition, granitic rocks of the Idaho Batholith have intruded sedimentary rocks; both are locally covered by Challis Volcanics. Major mines in the Vienna district - the Webfoot (Mountain King), Vienna, and Solace (pl. 1 and fig. 9, nos. 63-65) - and Sawtooth district - the Silver King and Pilgrim (pl. 1 and fig. 9, nos. 54 and 56) - are along shear zones in granitic rocks. The zones range from a few inches to 20 ft thick; most average 3 to 4 ft. Dominant trends are east-west and northwest with dips of 40° to 60° N. and NE. Ore minerals are mainly pyrargyrite, proustite, tetrahedrite, and argentite; other sulfide minerals commonly in shear zones include pyrite, galena, sphalerite, stibnite, and arsenopyrite. Gangue is predominantly quartz and altered wallrock, and alteration includes silicification, sericitization, and chloritization (Umpleby, 1915, p. 247-249; Ballard, 1928, p. 16-19). Fissure-filling quartz veins, shear zones with silicified and crushed wallrock, and contact metasomatic bodies are in the overlying sedimentary rocks, usually near granitic contacts. These structures contain pyrite, galena, sphalerite, chalcopyrite, bornite (copper iron sulfide), stibnite, and scheelite (calcium tungstate) (Tschanz and others, 1986, p. 460).

As of September 1985, 82 unpatented and 27 patented lode claims and millsites were current in the north addition or adjacent to it. Twenty-six mines and prospects are known; twelve were examined by USBM geologists in 1971 and 1972 (Tschanz and others, 1986, p. 461-464). Summary descriptions of mines and prospects are given in appendix C.



Mines, prospects, and claims

33. Mountain King mine
44. Star Mountain Silver claim group
45. Balloon group
46. Lucky Boy mine
47. Scotia mine
48. Eureka prospect
49. Ruby mine
50. Lone Jack prospect
51. Columbia mine
52. Beaver-Bidwell mine
53. Beaver Creek claims
54. Silver King mine
55. Sunbeam and Pride of the West mine
56. Pilgrim mine
57. Sawtooth City prospect
58. Ajax prospect
59. Beaver Creek prospect
60. P & D prospect
61. Ura claim group
62. Stibnite prospect
63. Webfoot (Mountain King) mine
64. Vienna mine
65. Solace mine
66. Chandler Western Reserve claim group
67. Goodhope prospect
68. E & D mine
69. Rabbit Foot prospect
70. Frenchie prospect
71. Salmon River propsect

FIGURE 9.–Mines, prospects, and claims in and near the north addition to the South Boise Yuba study area

Southwest Addition

The southwest addition to the study area, covering about 106,000 acres, takes in portions of the Yuba (Atlanta), Bear Creek (Rocky Bar), and Skeleton Creek mining districts (fig. 10). Gold and silver production from these district lode mines is valued at more than $13 million at historical prices; unreported placer gold production may be twice this total (Ballard, 1928, p. 11). Six mines are in the addition, and nine others are a mile or less from it. Mineralized structures at some of these mines may extend into the addition.

Gold and silver minerals in the Yuba and Bear Creek districts are in epithermal quartz vein deposits cutting granitic rocks of the Idaho Batholith. The Atlanta lode, the principal mined structure in the Yuba district, is 40 to 180 ft wide, strikes N. 55° to 75° E., dips near vertical, and is traceable for over 2 mi. Mined ore shoots in the lode were 200 to 800 ft long, 400 to 800 ft high, 4 to 30 ft thick, and contained gold, silver sulphosalts, and base-metal minerals (Anderson, 1939, p. 1). Other district veins trend east-west and northwest, and extend obliquely from the main (Atlanta) lode. Bear Creek district mines are on east-striking, north-dipping, fissure-filled veins and lodes, commonly 2 ft thick and 20 to 30 ft long (Anderson, 1943, p. 1). Gold is associated with pyrite, and base-metal sulfide minerals, or is free-milling. Little information is available for Skeleton district mines; they are presumed to be similar to deposits in the Yuba and Bear Creek districts.

In September 1985, BLM records indicated that 112 unpatented lode claims, 14 unpatented placer claims, and 5 patented lode claims were current in or adjacent to the addition. Diverse mining-related activity near the addition in 1985 included diamond drilling, placer gold mining, drill road construction, assessment work, and claim staking. Eleven mines and two prospects are summarized in appendix C.

Southeast Addition

The southeast addition to the study area includes about 120,000 acres of mountainous terrain west of Idaho State Highway 75 and north of a gravel road leading west from Ketchum, ID, along Warm Springs Creek. The addition takes in parts of the Big Smoky and geographically large Warm Spring mining districts and fringes of the Rosetta and Little Smoky districts. Thirteen known lode mines lie along the south border (pl. 1 and fig. 11) mainly in the Rosetta and Warm Spring districts. Since 1884, production of silver-zinc-lead ore from the Rosetta district and the included portion of the Warm Spring district is valued at about $2 million (Umpleby, 1915, p. 234; Ross, 1930, p. 19).

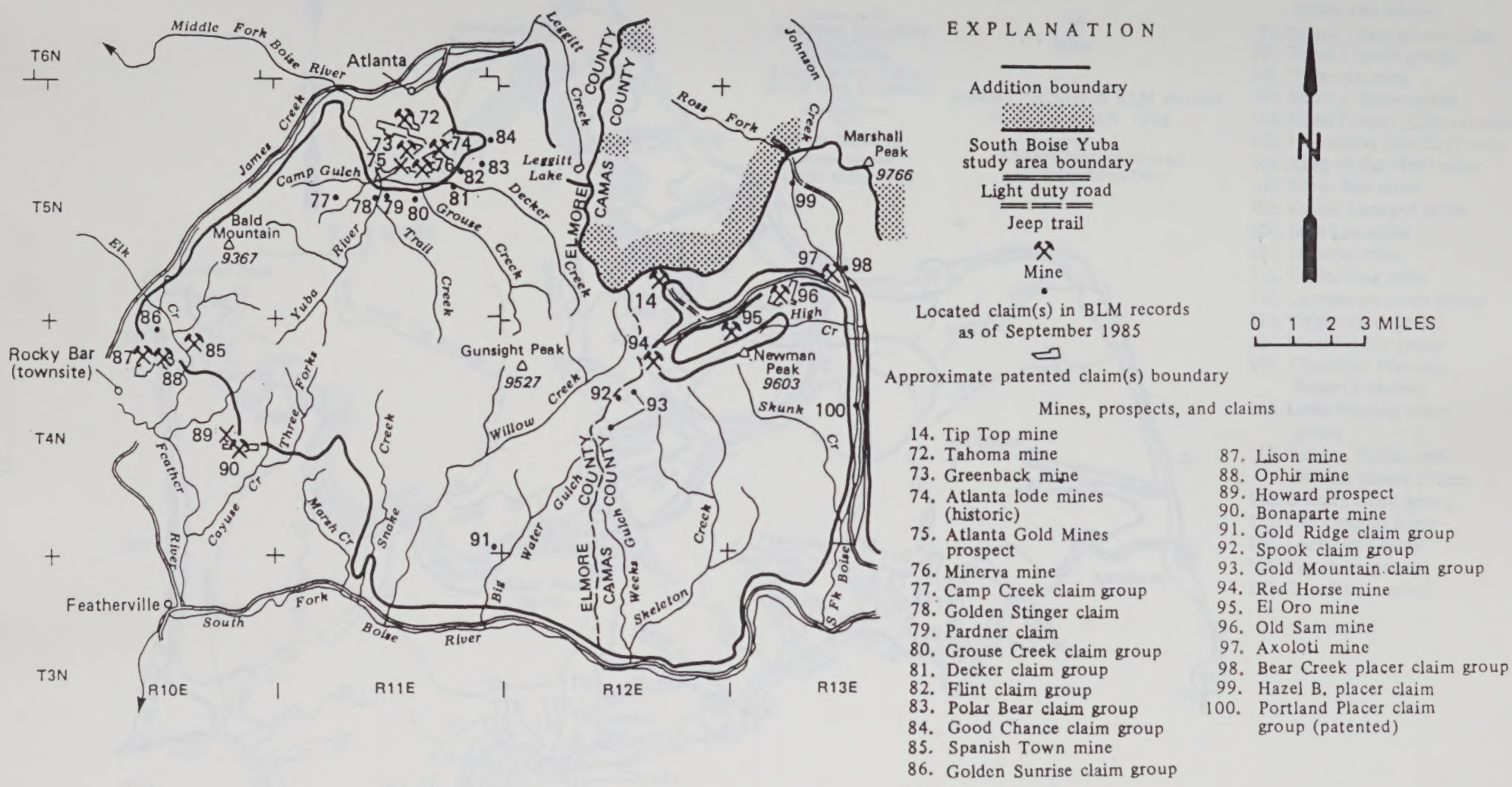


FIGURE 10. – Mines, prospects, and claims in and near the southwest addition to the South Boise Yuba study area

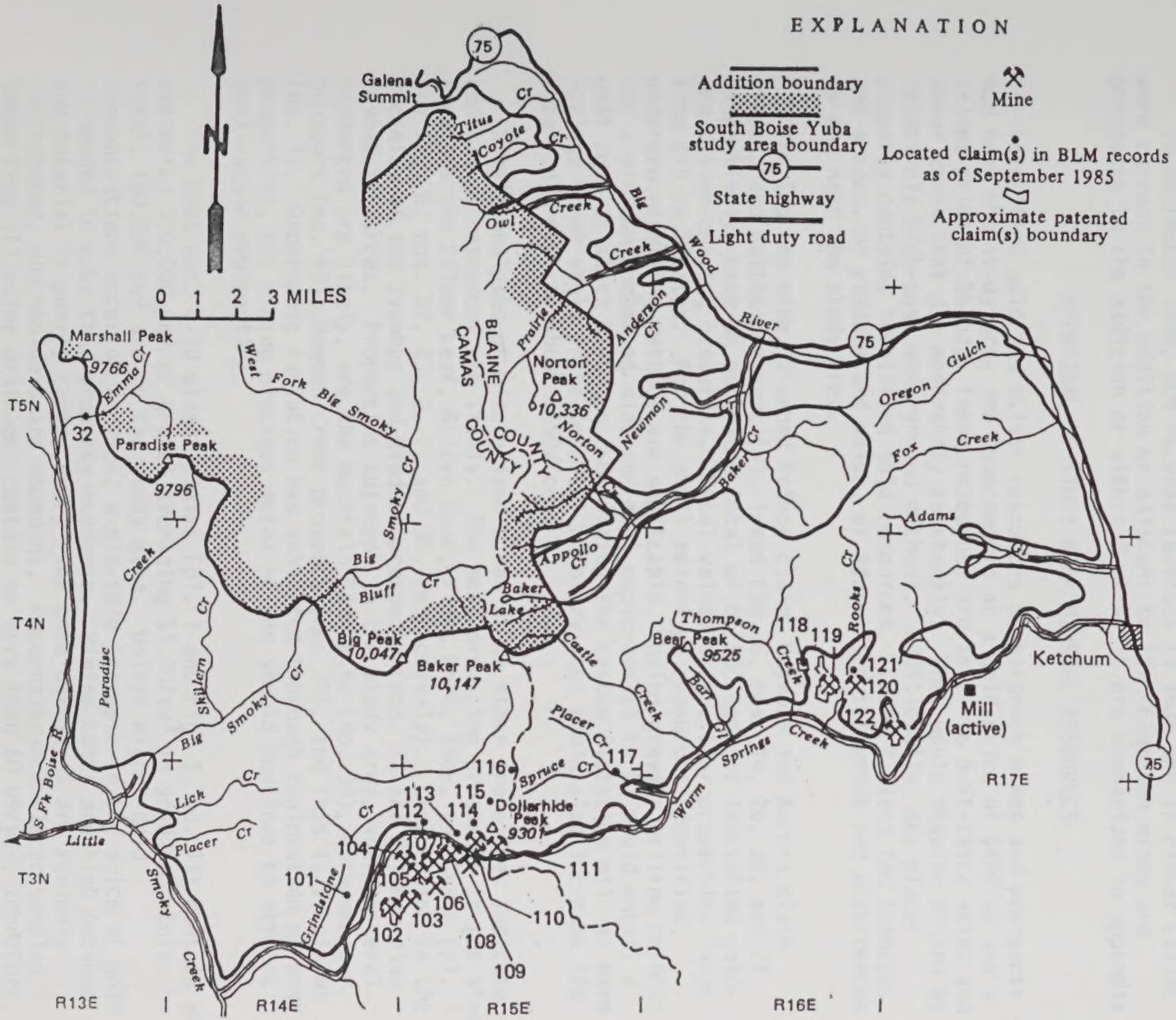


FIGURE 11.– Mines and claims in and near the southeast addition to the South Boise Yuba study area

Ore deposits occur mainly as northeast-trending, steeply-dipping fracture fillings and replacements in sedimentary rocks near granitic rock contacts. Deposits are generally 3 to 6 ft thick and less than 200 ft long (Umpleby, 1915, p. 233-240). Ore minerals are principally argentiferous galena, tetrahedrite, sphalerite, and chalcopyrite, accompanied by pyrite and arsenopyrite. Quartz-calcite or quartz-siderite and altered country rock are common gangue assemblages.

In September 1985, BLM records indicate 74 lode and 12 placer claims were current in the addition or adjacent to it. Fourteen mines and prospects in the addition or within 2 mi of it are summarized in appendix C.

APPRAISAL OF STUDY AREA MINERAL RESOURCES

Identified gold and silver resources at hardrock mines and prospects in and near the study area are subeconomic at a gold price of $400/oz and a silver price of $6/oz. These resources are in 1- to 5-ft-thick veins and shear zones that dip moderately to steeply. They would require mining by relatively high-cost underground methods. Additionally, one placer property contains identified gold resources. Table 2 lists the tonnages and grades, or yardage and value, of identified resources and occurrences in and near the study area.

The Tip Top mine, Diamond Prince claim, Raymond and Aurora claim groups, and Baltic prospect (pl. 1 and fig. 6, nos. 14, 26, 30, and 21, respectively) have an estimated total of 86,500 tons of identified gold- and silver-bearing resources. Metal values at the four properties range from $18 to $70/ton. For the small vein-type resources identified, underground mining methods are applicable. Using gravity milling methods and a minimum number of mine and mill employees (3 to 5) would entail a unit cost of about $100/ton. Utilizing the custom flotation mill at Warm Springs Creek would increase metal recovery, but would also increase the total unit cost to about $150/ton.

Sample analyses of mineralized zones at 14 other properties indicate additional resources are likely. The most promising prospects in the study area are the Silver Leaf, Golden Dawn, Pilot Knob, Ibex, and Susan (pl. 1 and fig. 6, nos. 27, 23, 2, 7, and 35, respectively). Exploration in the vicinity of the Ivanhoe and Windsor prospects (nos. 24 and 25) may also reveal resources. Properties adjacent to the study area, where mineral resources are likely, are the Mountain King mine (no. 33), Horseshoe prospect (no. 43), Newman Creek prospect (no. 38), and This Is It claims (no. 1). Geographic isolation has inhibited thorough exploration of most properties, but rising precious metal prices should continue to attract small-scale prospecting.

The Ross nos. 1-10 placer claims (pl. 1 and fig. 6, no. 11) contain an estimated 300,000 yd^3 of gravel averaging $1.00/$yd^3$ in gold. Of this total, 100,000 yd^3 are in the study area. Unless higher gold concentrations occur on bedrock, a six-fold increase in the price of gold is needed to make this property economic. Mining costs are high because the material is poorly sorted, very fine gold particles are randomly distributed, and boulders are abundant. Reconnaissance placer samples taken from all major drainages contain no more than $0.09/$yd^3$; therefore, additional placer examination is not merited.

TABLE 2.--Identified mineral resources in and near the South Boise Yuba study area

[*, partly outside the study area; **, outside the study area]

Map no. (plate 1)	Property name	Quantity (tons)	Quantity (yd^3)	Resource classification 1/	Weighted average grade (unit)	Commodity
11*	Ross nos. 1-10 placer claims		300,000	Indicated subeconomic resources	$1.00/$yd^3$ 2/	Placer gold
14**	Tip Top mine	47,000		Indicated and inferred subeconomic resources	0.07 oz/ton 3/	Gold
21	Baltic prospect	5,300		Inferred subeconomic resources	.1 oz/ton 1.4 oz/ton	Gold Silver
23	Golden Dawn prospect	680		Occurrence	3.8 oz/ton	Silver
26	Diamond Prince claim	5,200		Inferred subeconomic resources	.06 oz/ton 7.7 oz/ton	Gold Silver
30	Raymond and Aurora claim groups	29,000		Inferred subeconomic resources	.04 oz/ton .3 oz/ton	Gold Silver
33**	Mountain King mine	30		Occurrence	2.7 oz/ton 2.0% 23.0%	Silver Lead Zinc

1/ Resource definitions from U.S. Bureau of Mines and U.S. Geological Survey Circular 831, 1980.
2/ Value is based on a gold value of $400.00/oz.
3/ Mined ore averaged 0.44 oz/ton gold and 0.13 oz/ton silver.

Sand and gravel are plentiful along drainages and could supply local construction needs. However, the area is far from any possible major aggregate market. Rock types in the study area do not have unique characteristics and are not of value as decorative stone. No energy resources are known or reported in the area.

RECOMMENDATIONS FOR FURTHER STUDY

Mineral land evaluation (exploration) is generally divided into phases. Phase I involves perusal of all literature and records that might discuss geologic environment, mineral deposits and indicate location of properties, their mining history and potential for future production. Phase II studies involve field work which may include reconnaissance of large areas and mapping and sampling of known mineralized sites. Phases I and II were done for the study area; however, only Phase I work was completed for the additions. Generally, Phase II data are analyzed and preliminary site-specific assessments are made. Select sites are identified for detailed studies such as closer-spaced sampling, geophysical and geochemical surveys, and drilling. This work (Phase III) would be limited to deposits likely to be developed under current or near-future economic conditions.

Study Area

Identified subeconomic gold-silver resources were investigated at four lode properties and one placer property (table 2). Two other lode properties that were studied have mineral occurrences. Estimates of tonnage and grade were usually made by characterizing exposed short segments of mineralized zones, and extrapolating between, and a short distance beyond them. Additional exploration is needed to raise the confidence level of resource estimates and possibly increase the size of estimates. Work would consist of opening, and where necessary, retimbering workings for detailed mapping and sampling. Geochemical and geophysical surveys, particularly magnetic methods, should be conducted between sample localities and beyond vein exposures to verify extensions. Trenching and pitting would expose mineralized structures. Based upon analysis of data from these prerequisite detailed studies, drilling programs might be recommended for selected properties.

Detailed studies are also warranted at four other properties because of high precious-metal contents of samples. The properties are the Silver Leaf claims, and the Golden Dawn, Pilot Knob, and Ibex prospects. The Ivanhoe and Windsor prospects should also receive additional work as there is a 30-acre area on the claims, occupied by mineralized, closely spaced joints. Inaccessible workings on the Mountain King mine and Horseshoe prospect also should be examined.

The average gold value of $1.00/yd^3$ at the Ross nos. 1-10 placer claims may be significant for glaciofluvial material. Churn or rotary drilling is needed for the portion of the deposit in the study area. Gravel downstream from the confluence of Ross Fork and South Fork Boise River, adjacent to the study area, occurs in well-defined benches that have yielded higher gold values in the region. Trenching, pitting, and drilling of these benches is recommended.

Additions to the Study Area

All mines, prospects, and historic and current claims in the three additions, or near their borders, should be examined and, if warranted, mapped and sampled (Phase II studies). After completion of this work, determinations of Phase III studies may be made for selected properties.

At mines and prospects near the north addition, shear zones and quartz veins containing silver with gold and base metals probably extend into the addition. Brief examination of some of these properties in 1984 and 1985 revealed that most mine workings are caved; therefore, access is of prime importance. Detailed mapping and sampling at these historic mines might reveal significant silver and gold resources.

The Atlanta lode (Yuba mining district) and other mineralized structures in the Bear Creek district are being explored by mining companies for possible near-surface gold-silver deposits. Detailed mapping and sampling is needed to determine if these structures persist into the southwest addition.

Near the southern borders of the southeast addition, deposits of silver and base metals occur in shear zones and as replacements in sedimentary rocks of the Dollarhide Formation and granitic rocks of Tertiary and Cretaceous age. Investigation of similar rocks which underlie the addition may reveal similar mineral deposits. General and site-specific mapping and sampling of structural and alteration patterns are necessary to determine the economic significance of a cauldron postulated to underlie the addition.

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APPENDIX A: Mineral Property Descriptions

(numerical order)

APPENDIX A.--Descriptions of major mineral properties in or near the South Boise Yuba study area; see appendix D for discussion of minability requirements

LIST OF PROPERTIES DESCRIBED

Plate 1 No.	Name
2	Pilot Knob prospect
7	Ibex prospect
11	Ross nos. 1-10 placer claims
14	Tip Top mine
21	Baltic prospect
23	Golden Dawn prospect
26	Diamond Prince claim (patented)
27	Silver Leaf nos. 1-3 claims
30	Raymond and Aurora claim groups
33	Mountain King mine
35	Susan prospect
38	Newman Creek prospect
43	Horseshoe prospect

APPENDIX A.--Descriptions of major mineral properties in or near the South Boise Yuba study area; see appendix D for discussion of minability requirements--Continued

ILLUSTRATIONS

Figure A-1--Surface and underground map, Ibex prospect
A-2--Surface map, Ross placer claims
A-3--Photograph of hydraulicked pit on current Ross placer claims.
A-4--Surface map, Tip Top mine
A-5--Underground map and section view, Tip Top mine
A-6--Surface and underground map, Diamond Prince claim
A-7--Surface and underground map, Silver Leaf claims nos. 1-3
A-8--Surface map, Raymond and Aurora claim groups
A-9--Underground map, Raymond and Aurora claim groups
A-10--Surface and underground map, Mountain King mine
A-11--Surface and underground map, Newman Creek prospect
A-12--Surface map, Horseshoe prospect

Pilot Knob Prospect (no. 2)

The Pilot Knob prospect (pl. 1 and fig. 6, no. 2), along the steep ridge forming the study area's western boundary, was also investigated by USBM engineers in 1967 as part of the Sawtooth Primitive Area study (Kiilsgaard and others, 1970, p. D48-D49). Claims were located in 1933 by C. C. Vre Non, and a mill building was constructed in 1937 near the head of LaMoyne Creek. The property is no longer claimed. Principal access is by steep foot traverse from a jeep trail leading east from Atlanta. Production records are not available, but small amounts of material were probably transported to local mills in the Yuba district.

Quartz vein segments in quartz monzonite were explored on both sides of the ridge. On the southeast side, a 0.5- to 2.3-ft-thick vein strikes N. 60° W. and dips 62° to 85° SW. in a 3- to 5-ft-thick shear zone. This structure is exposed in a 27-ft-long adit and in a 32-ft-long trench 25 vertical feet above the adit; however, it is not traceable beyond the workings. The vein contains about 2 percent combined pyrite, arsenopyrite, galena, and sphalerite. One sample across the shear zone with vein material in the adit face contained 0.01 oz/ton gold; a sample across the vein taken by a USBM engineer in 1967 had 0.13 oz/ton gold (Kiilsgaard and others, 1970, D49) . In the trench, one select sample of vein material assayed 0.18 oz/ton gold, and a 28-in. chip sample across the vein taken in 1967 had 0.12 oz/ton gold. Silver content was less than 0.2 oz/ton, and copper, lead, and zinc contents were each less than 0.1 percent.

About 500 ft north of the adit and on the northwest slope of the ridge, a quartz vein is exposed in the face of a 100-ft-long trench. This 1.5-ft-thick vein segment strikes N. 50° W., dips 76° SW., and contains less than 1 percent pyrite and arsenopyrite. One chip sample taken during this investigation, and a similar sample during the 1967 study, had no significant precious-metal content. A caved adit, 300 ft northeast of the trench, had been started on a basalt dike. Stockpiled material indicates a pyrite-arsenopyrite-galena-bearing quartz vein was intersected in the adit which is estimated by dump volume to have 100 ft of workings. A 1967 sample of stockpiled vein material had 24 ppm gold (about 0.7 oz/ton), and a grab sample of quartz and highly iron-oxide-stained country rock collected for this study contained 0.08 oz/ton gold. Silver and lead contents were insignificant.

About 0.5 mi northwest of these workings, an 81-ft-long adit was driven behind the mill building (Kiilsgaard and others, 1970, p. D48). USBM engineers reported vein material was not present in the adit or dump. One dump sample taken during the 1967 study contained no anomalous amounts of precious-metals.

Most chip samples of quartz vein segments contain gold concentrations too low to be mined by the required underground mining methods. Further exploration of this prospect is likely to reveal small tonnages of high-grade material, some of which may constitute resources. However, the remoteness of this prospect is a major deterent to prospecting.

Ibex Prospect
(no. 7)

The Ibex prospect (pl. 1 and fig. 6, no. 7) is in the saddle between the headwaters of Gold Run and Johnson Creeks. It is reached by 3 mi of pack trail from the jeep road leading up Ross Fork basin. Vaguely described claims were staked in this vicinity as early as 1881. In 1905, G. McAllister and others located the Plata, Joseph, Richards, North Star, Central, and Lehigh claims. In 1932, he and J. Kimmel restaked this group under different claim names. The Ibex nos. 1-5 claims were located in 1953 by L. and H. Washburn. No claims were held in this vicinity in September 1985. Small quantities of material may have been mined from the stope in the open adit (fig. A-1) and shipped to a local mill, but there are no production records.

Quartz monzonite of the Idaho Batholith underlies the Ibex prospect. Mineralized material is mainly in northwest-trending shear zones of fractured, silicified, and sericitized country rock. Within the zones, lenses and pods of white and gray vein quartz and comb quartz contain disseminations and blebs of pyrite and arsenopyrite. The most highly mineralized zone strikes N. 70° to 80° W., dips 60° NE., and is exposed only in the open adit (fig. A-1, nos. 7 and 8). Adit walls and roof are in poor condition, thus allowing only minimal sampling. Other prospect workings include one caved adit, probably less than 30 ft long, one sloughed, shallow shaft, and six prospect pits.

The localities of 12 samples taken on the prospect are shown on figure A-1, and gold and silver analyses are given in the accompanying table. One chip sample (no. 7) across a 6.6-ft-thick shear zone segment in the adit contained 0.71 oz/ton gold and 0.4 oz/ton silver. One 2-ft sample (no. 8) of the same structure on the opposite adit wall contained 0.08 oz/ton gold and no silver. Of the remaining 10 samples, 9 had trace amounts to 0.06 oz/ton gold and no silver. Base-metal content was less than 0.015 percent in all samples.

Sample results at the Ibex prospect were encouraging; however, paucity of mineralized zone exposures prevented resource assessment. Two samples across material representing the main zone averaged 0.4 oz/ton gold. This would be a minable grade by underground techniques if sufficient tonnage could be identified. The 10 remaining samples, from widely spaced localities, averaged 0.02 oz/ton gold. Additional prospecting and exploration at the property may reveal minable resources.

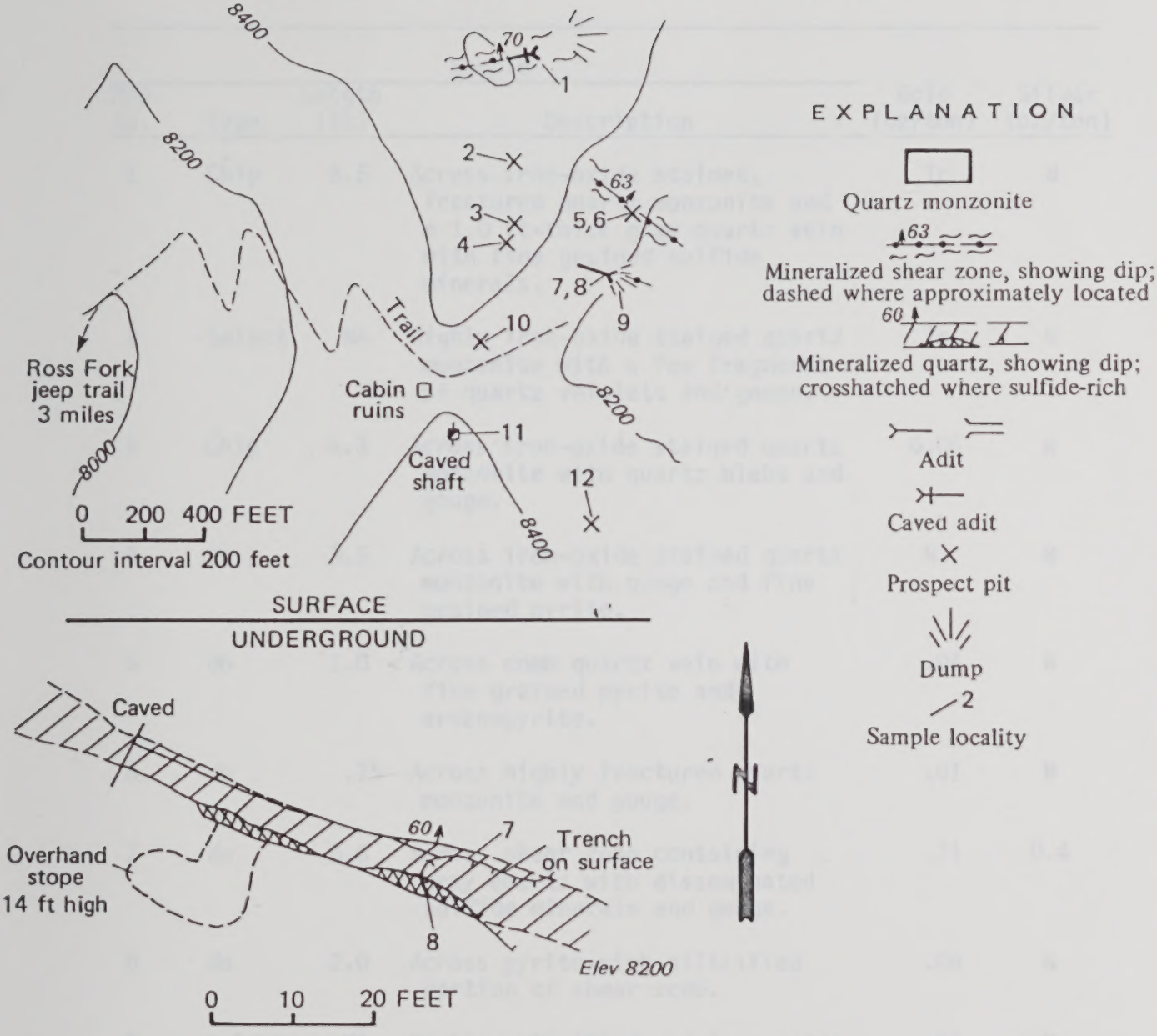


FIGURE A-1–Surface and underground map, Ibex prospect

Ibex prospect
Data for samples shown in figure A-1.

[Tr, trace; N, none detected; NA, not applicable]

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
1	Chip	8.5	Across iron-oxide stained, fractured quartz monzonite and a 1.0 ft-thick gray quartz vein with fine grained sulfide minerals.	Tr	N
2	Select	NA	Highly iron-oxide stained quartz monzonite with a few fragments of quartz veinlets and gouge.	Tr	N
3	Chip	4.3	Across iron-oxide stained quartz monzonite with quartz blebs and gouge.	0.06	N
4	do	3.5	Across iron-oxide stained quartz monzonite with gouge and fine grained pyrite.	N	N
5	do	1.0	Across comb quartz vein with fine grained pyrite and arsenopyrite.	.04	N
6	do	.75	Across highly fractured quartz monzonite and gouge.	.01	N
7	do	6.6	Across shear zone containing gray quartz with disseminated sulfide minerals and gouge.	.71	0.4
8	do	2.0	Across pyrite-rich silicified portion of shear zone.	.08	N
9	Select	NA	Highly silicified and iron-oxide stained quartz monzonite with fine grained pyrite.	.01	N
10	Chip	5.0	Across iron-oxide stained, sheared rock and gouge.	.02	N
11	Grab	NA	Decomposed granitic rock with slight iron-oxide stain and clay material.	.03	N

Ibex prospect--Continued

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
12	Select	NA	Highly iron-oxide stained grainitic rock with narrow quartz veins and sericite.	Tr	N

Ross Nos. 1-10 Placer Claims
(no. 11)

The Ross nos. 1-10 placer claims (pl. 1 and fig. 6, no. 11) lie along the broad glacial valley of Ross Fork, 40 mi north from Fairfield over surfaced, graveled, and unmaintained jeep roads. Camas County mining claim records indicate placer claims were first located near the Ross Fork-Little Bear Creek confluence in 1899. Subsequently, about 50 placer claims were recorded in the vicinity, mainly in the periods 1902 to 1905, 1931 to 1939, and in 1950. In 1980 Bolero Mining Company, Boise, ID, recorded the Ross nos. 1-10 claims and continued to hold them through 1985. Production records are not available. However, judging from the extent of placer development and USBM sample results, production is estimated to be about 20 oz of gold from 5,000 yd^3 of excavated material. Based on condition of workings and equipment ruins, most development was prior to 1940.

Thick Quaternary alluvium, mostly of glaciofluvial origin, underlies Ross Fork basin. The valley floor is 4 mi long and 0.5 to 1 mi wide. Depth to bedrock is estimated to be at least 100 ft. The alluvium consists of granitic rocks of the Idaho Batholith, minor amounts of mafic and siliceous dike rocks, and quartz eroded from surrounding mountainsides. The alluvium is poorly sorted except where former stream channels have moderately sorted the material into 5- to 10-ft-thick layers. These channels also form subdued terraces along Ross Fork. Particle sizes at sample localities are approximately: boulders (30 percent), cobbles (20 percent), gravel (20 percent), pebbles (20 percent), and sand and silt (10 percent). Boulders as much as 4 ft across had no doubt been detrimental to development.

Most workings are near the mouth of Little Bear Creek (fig. A-2). A hydraulicked pit with a 20-ft highwall and adjacent shallow ground sluice trenches cover about 0.3 acre along the south side of Ross Fork (fig. A-3). Eighteen pits and trenches and a flooded shaft, at least 15 ft deep, explore gravel mainly along the north side of Ross Fork. The pits are usually less than 5 ft deep and 10 ft in diameter. Trenches had been dug 8 to 12 ft down the creek bank to water level. Segments of ditches used for transporting water from tributaries, to wash the gravel, are ubiquitous on both sides of lower Ross Fork.

During the USBM investigation, 99 channel samples were taken from 21 hand-dug trenches and 20 backhoe-dug pits, principally along the lower mile of Ross Fork (fig. A-2). Sixty samples from trenches were taken in 3- to 5-ft-long segments down the sides of the trenches; one linear foot represented 0.01 yd^3 of material. Six of these samples, not shown on fig. A-2, were at three localities about 0.5 mi apart, starting upstream 0.5 mi from sample locality B-1 (fig. A-2). Thirty-nine samples, taken down the pit sides in 3- to 5-ft segments, were from backhoe pits which were 5 to 10 ft deep. Each sample contained 0.5 yd^3 to 0.8 yd^3 of material. Samples were concentrated in a 7-ft-long sluice box or were panned by hand in the field. Gold weights in samples were determined in the wet (placer) laboratory at WFOC.

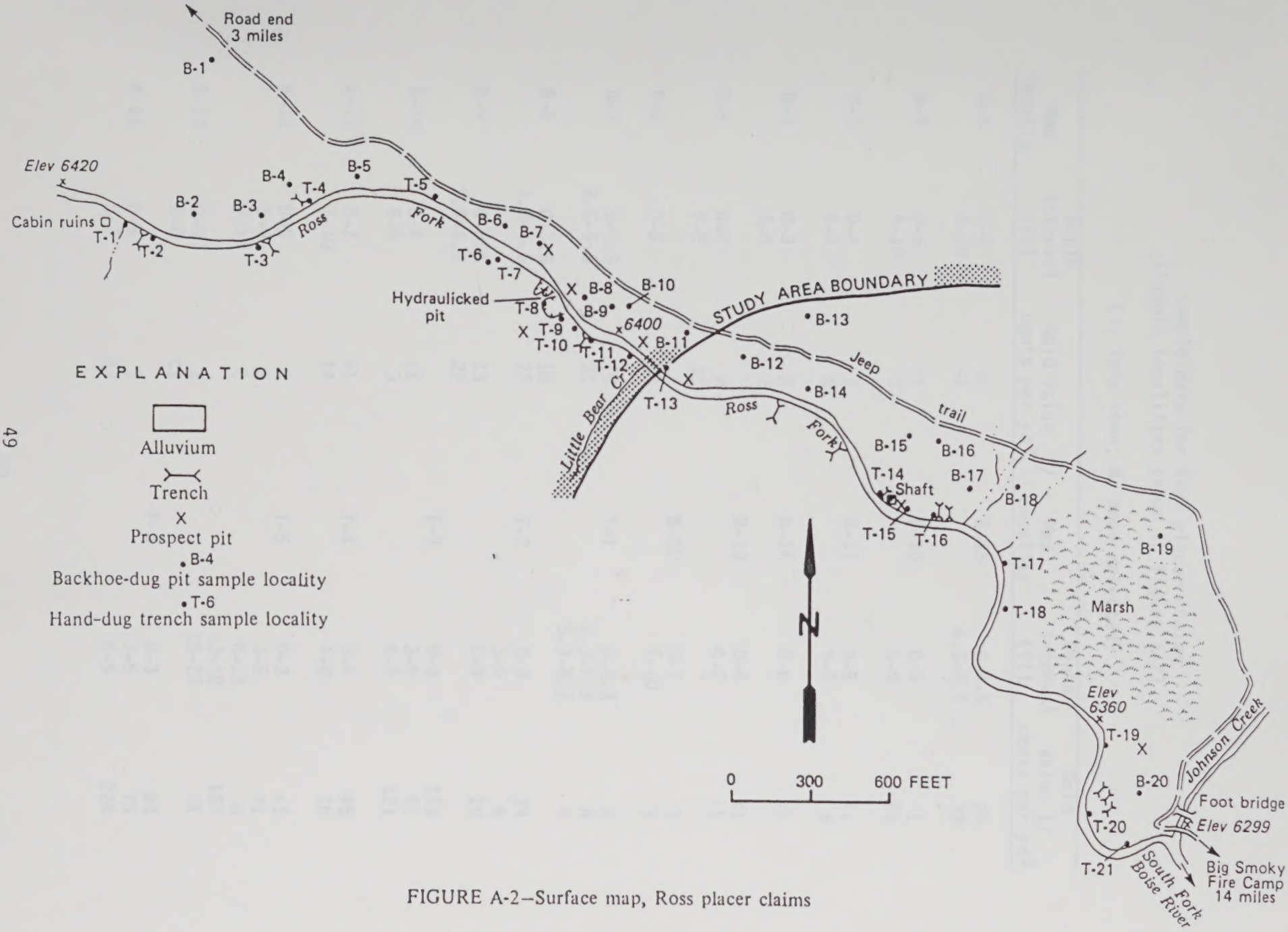


FIGURE A-2—Surface map, Ross placer claims

Sample data for Ross placer claims
(Sample localities shown in figure A-2)

[<, less than; N, none detected]

Map locality	Depth interval (ft)	Gold value 1/ cents per yd^3	Map Locality	Depth interval (ft)	Gold value 1/ cents per yd^3
B-1	0-5	<1	B-15	0-4.5	26
	5-10	<1		4.5-8.5	39
B-2	0-5	<1	B-16	0-5	<1
	5-10	3		5-8	24
B-3	0-4	1	B-17	0-5	<1
	4-7	8		5-8	5
B-4	0-3	2	B-18	0-6	<1
	3-6	2			
			B-19	0-4	<1
B-5	0-5	2		4-7	<1
	5-8	31			
			B-20	0-7	3
B-6	0-5	12		7-10	9
B-7	0-2.5	18	T-1	0-2.3	6
	2.5-5.5	31		2.3-5.3	N
				5.3-8.3	4
B-8	0-3.5	10			
	3.5-6.5	22	T-2	0-3	24
				3-6	8
B-9	0-3.5	13		6-9	10
	3.5-6.5	22			
			T-3	0-3	159
B-10	0-6	<1		3-6	41
	6-8	3		6-9	121
B-11	0-7	<1	T-4	0-4	45
	7-10	14		4-8	16
B-12	0-5	6	T-5	0-3	<1
	5-9	5		3-8	<1
	9-10	2		8-13	6
				13-18	157
B-13	0-5	2		18-23	31
	5-8	13			
			T-6	0-3	84
B-14	0-5	3		3-6	75
	5-7	23		6-9	224

Sample data for Ross placer claims--Continued

Map locality	Depth interval (ft)	Gold value 1/ cents per yd^3	Map Locality	Depth interval (ft)	Gold value 1/ cents per yd^3
T-7	0-3	94	T-14	0-3	144
T-8	0-5	32	T-15	0-3	138
	5-10	16			
	10-16	19	T-16	0-2	13
	16-21	57		2-5	153
	21-26	93			
	26-30	20	T-17	0-7	176
	30-33	245		7-12	207
T-9	0-4	20	T-18	0-6	16
				6-11	27
T-10	0-2	56			
	2-5	130	T-19	0-6.5	71
	5-8	196		6.5-13	14
	8-11	74			
			T-20	0-1.5	281
T-11	0-2	218		1.5-3	35
	2-5	174			
			T-21	0-7	182
T-12	0-3	226		7-12	73
				12-17	17
T-13	0-5	5			
	5-10	311			
	10-15	<1			
	15-21	119			

1/ Based on gold valued at $400 per troy ounce and a gold fineness of 750.

Figure A-3--Photograph of hydraulicked pit on current Ross placer claims. Note the abundance of boulders.

Gold concentrations in samples ranged widely, both laterally and with depth, as is typical of poorly sorted glaciofluvial material well above bedrock. Samples from hand-dug trenches had gold values ranging from zero to $3.11/yd^3$ (at a gold price of $400/oz and gold fineness of 750); 19 of 60 samples contained more than $1.00/yd^3$ gold. Six samples, upstream from locality B-1, had gold values beween $0.02/yd^3$ and $0.07/yd^3$. Backhoe-dug samples had gold values ranging from nil to $0.39/yd^3$; most had less than $0.15/yd^3$ gold. No economically significant amounts of other heavy minerals were detected.

To the depth sampled, the claims contain an estimated 300,000 yd^3 of gravel with an average gold value of $1.00/yd^3$. Of the total, about 100,000 yd^3, with an average gold value of $0.96/yd^3$, are in the study area between sample locality T-3 and Little Bear Creek (fig. A-2). Calculations assume uniform gold values along a 1,500-ft length, a 150-ft width (twice the distance from the hydraulicked highwall to the Ross Fork), and to a depth of 12 ft (average sample depth). Twenty-three trench samples (fig. A-2, T-3 and T-6 to T-12) used for grade estimation, were weighted by sample length.

The remaining 200,000 yd^3 of placer resource outside the study area, average $1.01/yd^3$. This portion of the placer deposit has an estimated width of 150 ft and extends 3,000 ft along the north side of Ross Fork (from sample locality T-13 to T-21). An average depth of 12 ft was also assumed. The assays were weighted by sample length to obtain the average grade.

The Ross Fork deposit would require gravel averaging about $6.00/yd^3$ gold to be profitably mined. However, values averaging $1.00/yd^3$ in near-surface, glaciofluvial material appear significant. Gold concentrations are expected to be higher nearer bedrock, where gold is more likely to be concentrated. Therefore, a drilling program, using churn or reverse-cirulation methods, is necessary to test the placer deposit at depth, and to test other material laterally and downstream.

Tip Top Mine
(no. 14)

The Tip Top mine (pl. 1 and fig. 6, no. 14) consists of the Tip Top nos. 1-18 claims and two millsites which were current in 1985, all owned by Richard and Rena Day. Workings are within the southwest addition and 1,000 ft south of the study area boundary; however, the claims extend into the study area. From Fairfield, access is by 35 mi of paved and graveled roads, then 5 mi of jeep trail; total travel time is approximately 2 hours.

Prospecting activity at the Tip Top probably dates back to the 1870's or 1880's when the nearby Yuba (Atlanta) mining district was active (Anderson, 1939, p. 1). USBM records show 131 tons of ore yielded 58 oz of gold and 18 oz of silver from 1939-1941 when Winnefer Gibson was the operator. According to the owner (Richard Day, oral commun., 1985), Alfred Packer produced gold from the property prior to 1937.

Country rock is quartz monzonite of the Idaho Batholith. A gold-bearing shear zone that strikes N. 60° to 85° E. and dips 35° to 82° SE. is exposed in four adits and one prospect pit (figs. A-4 and A-5). The zone is composed of finely crushed quartz monzonite, punky gouge, quartz, rounded fragments of quartz monzonite and quartz in gouge, pyrite-arsenopyrite-bearing lenses of silicified gouge, and moderate iron- and manganese-oxide stains. Visible gold was observed near adits C and D. Silicic and sericitic alteration occurs throughout the zone. In adit B at sample locality 15, a silicified pyrite-arsenopyrite-rich lens is enclosed by and is oriented oblique to the shear zone. At several localities similarly composed lenses follow the hanging wall. These features are similar to those reported to be at Yuba district mines (Anderson, 1939, p. 14-16).

The Tip Top is developed by four adits with lengths of 260, 160, 40, and 15 ft, two caved adits probably less than 50 ft long, and six shallow prospect pits less than 6 ft in diameter. No more than 100 tons of material could have been removed from any of the three small stopes in the open adits. A small, portable, hand-made gravity mill was being tested at the property in 1985.

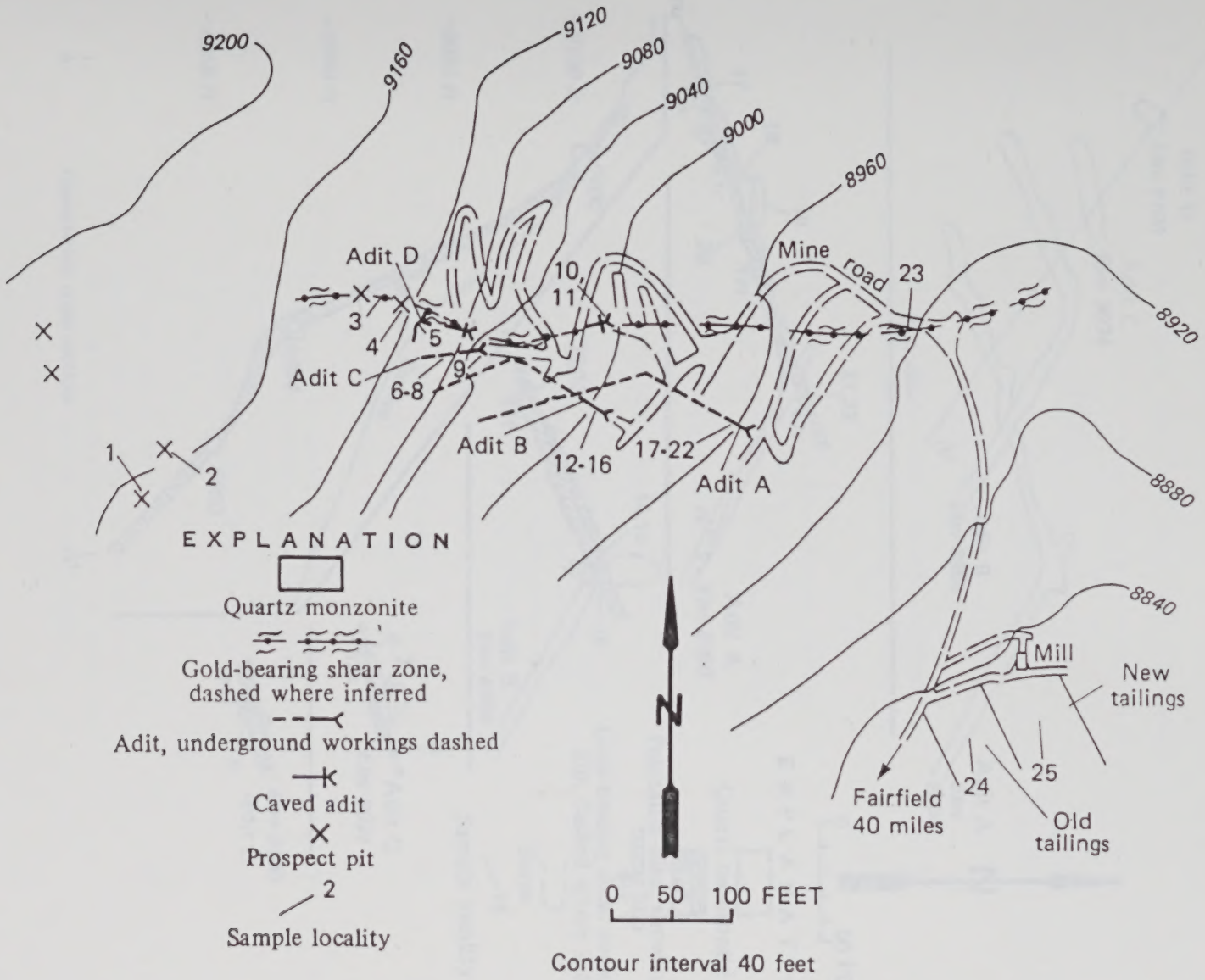


FIGURE A-4—Surface map, Tip Top mine

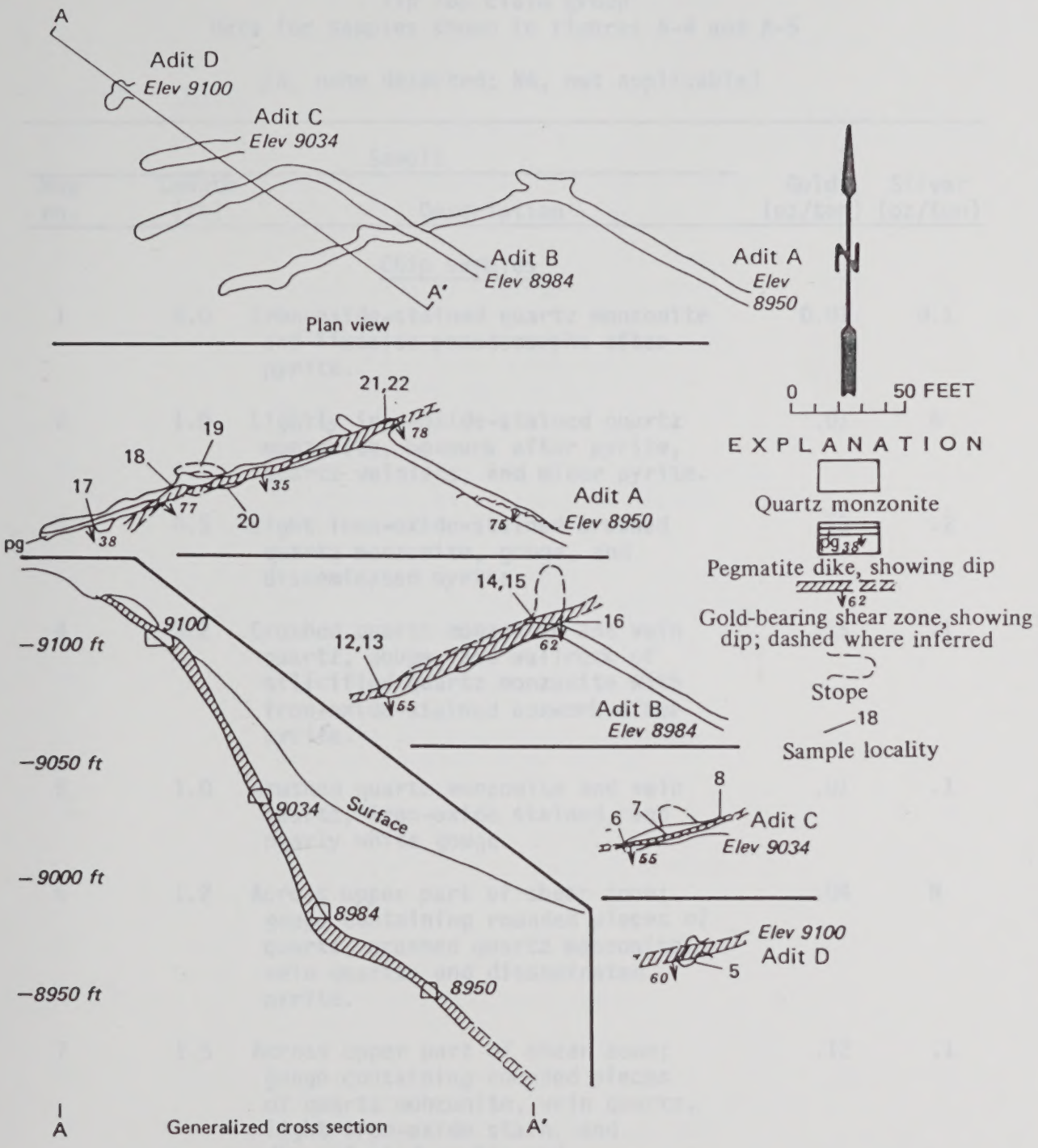


FIGURE A-5—Underground map and section view, Tip Top mine

Tip Top claim group
Data for samples shown in figures A-4 and A-5

[N, none detected; NA, not applicable]

Sample			Gold	Silver
Map no.	Length (ft)	Description	(oz/ton)	(oz/ton)
		Chip samples		
1	5.0	Iron-oxide-stained quartz monzonite and limonite pseudomorphs after pyrite.	0.01	0.1
2	1.0	Lightly iron-oxide-stained quartz monzonite, boxwork after pyrite, quartz veinlets, and minor pyrite.	.01	N
3	0.5	Light iron-oxide-stained crushed quartz monzonite, gouge, and disseminated pyrite.	.73	.2
4	3.2	Crushed quartz monzonite and vein quartz, gouge, and wallrock of silicified quartz monzonite with iron-oxide-stained boxwork after pyrite.	.15	.1
5	1.0	Crushed quartz monzonite and vein quartz, iron-oxide stained, and nearly white gouge.	.01	.1
6	1.2	Across upper part of shear zone; gouge containing rounded pieces of quartz, crushed quartz monzonite, vein quartz, and disseminated pyrite.	.04	N
7	1.5	Across upper part of shear zone; gouge containing rounded pieces of quartz monzonite, vein quartz, light iron-oxide stain, and disseminated pyrite and arsenopyrite.	.12	.1
8	4.0	Crushed quartz monzonite, quartz veinlets, gouge, and light iron-oxide stain.	.01	.1

Tip Top claim group--Continued

Map no.	Sample Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
9	3.0	Crushed quartz monzonite, latite dike, vein quartz, gouge, and iron-oxide stain.	0.06	0.2
10	2.8	Across bands of iron-oxide-stained, highly fractured quartz monzonite, highly silicified quartz monzonite, and lightly iron-oxide-stained gouge with rounded pieces of intrusive and quartz.	.01	N
11	1.0	Crushed and silicified quartz monzonite with disseminated limonite pseudomorphic after pyrite.	.01	.1
12	1.3	Gouge with rounded pieces of quartz, iron-oxide-stained quartz monzonite, and minor disseminated pyrite.	.41	.1
13	1.0	Across 8-in.-thick quartz vein enclosed in gouge. Quartz vein contains disseminated iron-oxide-stained boxwork after pyrite.	.27	N
14	1.3	Across upper part of shear zone above stope in ore shoot; lightly iron-oxide stained gouge with minor disseminated pyrite.	.03	N
15	1.3	Across lens of rounded pieces of quartz in silicified gouge and disseminated pyrite and arsenopyrite.	.15	.1
16	1.0	Across upper part of shear zone; gouge, crushed and iron-oxide-stained quartz monzonite, and vein quartz.	.05	N
17	.8	Across pegmatite dike.	.01	N

Tip Top claim group--Continued

Map no.	Length (ft)	Sample Description	Gold (oz/ton)	Silver (oz/ton)
18	1.3	Across upper part of shear zone; highly silicified crushed quartz monzonite, gouge with rounded pieces of quartz, and disseminated pyrite and arsenopyrite.	0.07	N
19	2.0	Across upper part of shear zone; gouge with rounded pieces of quartz and disseminated pyrite and arsenopyrite.	.07	N
20	1.0	Across upper part of shear zone; iron-oxide-stained fractured quartz and gouge, disseminated pyrite and arsenopyrite.	.66	0.2
21	1.8	Across lower part of shear zone; crushed quartz monzonite, gouge with rounded pieces of quartz and disseminated pyrite.	.02	N
22	1.5	Across footwall of shear zone; iron-oxide-stained, crushed quartz monzonite.	.01	N
23	0.8	Gouge with rounded pieces of quartz monzonite, and vein quartz.	.01	.1
		Grab samples		
24	NA	Tailings from old mill (pre-1937); iron-oxide-stained coarse-to-fine sand and clay.	N	N
25	NA	Tailings from newer mill (post-1937); iron-oxide-stained sand and clay with 5% to 10% black sand.	.28	.2

There are an estimated 47,000 tons of indicated and inferred subeconomic resources in the mineralized shear zone. This assumes the zone: (1) is continuous for 400 ft between sample nos. 3 and 23 (fig. A-3 and A-4) and extends beneath surface cover an additional 150 ft east and 200 ft west for a total length of 750 ft; (2) extends downdip 375 ft, one-half the strike length; and (3) maintains an average thickness of 2 ft. A tonnage factor of 12 ft^3/ton was used in the calculation. Twenty samples (nos. 3-16 and 18-23) of zone segments have a weighted average (by sample length) of 0.07 oz/ton gold. In the adit vicinity, the zone contains about 2,600 tons of higher grade material averaging 0.14 oz/ton gold. This assumes a block about 175 ft long, a downdip continuity of 90 ft, and an average thickness of 2 ft. Production records indicate mined ore averaged 0.44 oz/ton gold and 0.13 oz/ton silver. One grab sample (no. 25) of recent mill tailings assayed 0.28 oz/ton gold; however, the volume of those tailings could not be estimated with any assurance.

Most chip samples across the mineralized shear zone represent material with gold concentrations that are too low to be minable by underground mining methods. However, some chip samples and production records indicate that ore-grade concentrations may occur in shoots or pods in the shear zone.

The resource block is in the southwest addition, and the mineralized zone does not trend toward the study area. Except for part of the claim block, the property is in the southwest addition. Exploration of the zone to depth and to the west will probably reveal additional gold-bearing shoots or pods. More prospecting is warranted because this zone has many features of mines in the nearby Yuba mining district, such as similar mineral assemblages, alteration suites, structure, and host rocks.

Baltic Prospect
(no. 21)

The Baltic prospect (pl. 1 and fig. 6, no. 21) lies at an elevation of about 7,000 ft on the east side of Johnson Creek and about 3 mi from its mouth. Camas County claim records indicate the Baltic was located in this vicinity in 1879 by George Pease; however, no claims were held at this locality in September 1985. Access is by pack trail from gravel and jeep roads leading up the South Fork Boise River to Johnson Creek.

A massive, milky-quartz fissure vein cuts silicified granodiorite of the Idaho Batholith. Vein segments strike N. 70° W. to N. 65° E. and dip northerly 25° to 40° N. Segments range from 2 to 5 ft thick and are traceable along strike for 1,200 ft. Quartz is stained with iron oxides and contains pyrite, galena, and chalcopyrite in small, widespread pods.

Prospect workings include a 15-ft-deep inclined shaft, a 10-ft by 5-ft pit on the easternmost vein exposure, and a 6-ft by 4-ft pit on the westernmost outcrop. Three chip samples of western vein outcrops contained 0.07 to 0.16 oz/ton gold and 1.2 to 1.5 oz/ton silver. One of five chip samples of the vein near the shaft and eastern pit had 2.1 oz/ton silver, 0.36 percent lead, and no gold. Other samples of eastern vein exposures assayed below 1.0 oz/ton silver and trace or no gold. Copper, lead, and zinc concentratrions were less than 0.01 percent for each element.

About 5,300 tons of inferred subeconomic resources averaging 0.1 oz/ton gold and 1.4 oz/ton silver is estimated for the western end of the vein. This assumes a distance between sample localities of 160 ft, a downdip continuity of 80 ft (one-half the strike length), and an average thickness of 5 ft. A tonnage factor of 12 ft^3/ton is used in the calculation. Additional prospecting between and beyond vein exposures may reveal additional gold and silver resources.

Samples representing vein material indicate that the average value of the resources is $50/ton (computed using a gold price of $400/oz and a silver price of $6/oz). This value is approximately one-half the dollar amount required to mine a vein deposit by underground mining methods and to recover gold and silver with optimum, low-cost metallurgical techniques (appendix D).

Golden Dawn Prospect
(no. 23)

The prospect (pl. 1 and fig. 6, no. 23) is probably on the Golden Dawn claim recorded by C. F. Krum and others in 1896. No claims were held in 1985 in this vicinity. Prospect workings are on a talus-covered mountainside at an elevation of 9,400 ft. They are reached by a 2-mi traverse southeast from the end of Beaver Creek road.

A sulfide-bearing quartz vein in quartz monzonite is explored by a 7-ft-deep shaft and a 12-ft-long by 8-ft-wide pit; workings are 90 ft apart. This 1.1- to 2.5-ft-thick vein strikes N. 60° W., dips 65° to 70° NE., and is in a 4- to 5-ft-thick shear zone with a similar attitude. The vein contains massive and comb quartz with about 5 percent combined fine-grained pyrite, galena, sphalerite, and pyrargyrite, usually in small pods. Stockpiled vein quartz at the shaft has grains of these sulfide minerals, except pyrargyrite, as much as 0.25-in. in diameter. Three chip samples across the vein contained a trace to 0.01 oz/ton gold, 2.7 to 7.8 oz/ton silver, and as much as 0.16 percent lead and 0.10 percent zinc. One select sample at the shaft dump had 0.17 oz/ton gold, 84.3 oz/ton silver, 2.3 percent lead, and 4.7 percent zinc. One select sample at the trench had trace gold, 3.2 oz/ton silver, 1.2 percent lead, and 3.4 percent zinc.

Short segments of 8-ft and 2.5-ft-thick shear zones are exposed about 300 ft south and 1,500 ft west, respectively, from the shaft. Both heavily iron-oxide-stained structures trend northwest and contain 1- to 5-in.-thick quartz stringers and silicified quartz monzonite. Fine-grained pyrite is in the 2.5-ft-thick western zone. One chip sample across each zone had no significant amounts of gold or silver.

An occurrence of 680 tons averaging 3.8 oz/ton silver (weighted by sample length) with accessory gold, lead, and zinc is estimated for the main quartz vein. This estimate assumes the vein is continuous between workings (90 ft), extends downdip 45 ft, and averages 2 ft thick. There are no vein extensions exposed beyond the workings. A tonnage factor of 12 ft^3/ton is used in the calculation. Although the grade and tonnage indicate the vein is not minable by selective underground mining methods, exploration beyond the workings should reveal additional high-grade material which may constitute resources.

Diamond Prince Claim (Patented)
(no. 26)

The Diamond Prince (pl. 1, fig. 6, no. 26) is the only patented claim in the study area. The claim was located by S. L. Ewing in 1882, surveyed in 1903, and patent (no. 1872) was issued to Mr. Ewing in 1905. His daughter, H. Ewing, was the owner in 1985. The property lies at an elevation of 8,700 ft near the headwaters of an unnamed creek which drains into Johnson Creek. Nearest access is by foot over 1.6 mi of rough terrain westerly from the end of the Smiley Creek road. No production records are available, but small quantities of high-grade material were probably sent to a nearby mill(s) in the Vienna or Sawtooth district.

Coarse-grained granodiorite of the Idaho Batholith is cut by shear zones filled with quartz veins and silicified and sericitized country rock. The principal vein, exposed in the 48-ft adit (fig. A-6), is 3 to 12 in. thick and enclosed in a 1- to 3-ft-thick silicified shear zone which trends N. 75° E. to S. 80° E. and dips steeply to the north. The vein contains lenses and pods of fine-grained pyrite and pyrargyrite with coatings of iron and manganese oxides and copper carbonates. It is covered by talus in the adit vicinity; however, pieces of mineralogically similar vein material occur at a 10-ft-diameter sloughed prospect pit 500 ft east of the adit. The vein may also have been explored by a 64-ft-long, southeast-trending adit shown on the mineral survey plat. Thick talus evidently covers this working.

The localities of seven samples taken on the claim are shown in figure A-6, and gold and silver analyses are given in the accompanying table. Copper, lead, and zinc contents are below 0.1 percent.

There is an estimated 100 tons of vein material near the open adit. This assumes a resource block 48 ft long, 24 ft deep, and 1 ft thick, and a tonnage factor of 12 ft^3/ton. Four samples (fig. A-6, nos. 3-6) taken across the vein and shear zone had an average (weighted by sample length) of 0.07 oz/ton gold and 7.8 oz/ton silver. Additionally, pieces of vein quartz on the pit dump (fig. A-6, no. 7) indicate an eastward vein extension of 500 ft with an apparent thickness of 0.5 ft. Assuming the vein is continuous along strike for 500 ft and extends downdip for 250 ft (one-half the strike length), 5,200 tons of subeconomic resources can be inferred. Averaging sample nos. 3-6 with no. 7 gives a grade of 0.06 oz/ton gold and 7.7 oz/ton silver.

This vein contains a small, moderate-grade subeconomic resource of gold and silver. At precious-metal prices of $400/oz gold and $6/oz silver, the average value of the resource is about $70/ton. Narrow vein thickness would result in excessive dilution of ore, thus decreasing mine grade. Tonnage and grade estimates indicate the vein is not economically minable by the underground mining techniques which would be required. Further prospecting of the vein, particulary toward the adit shown on the survey plat, may reveal more resources.

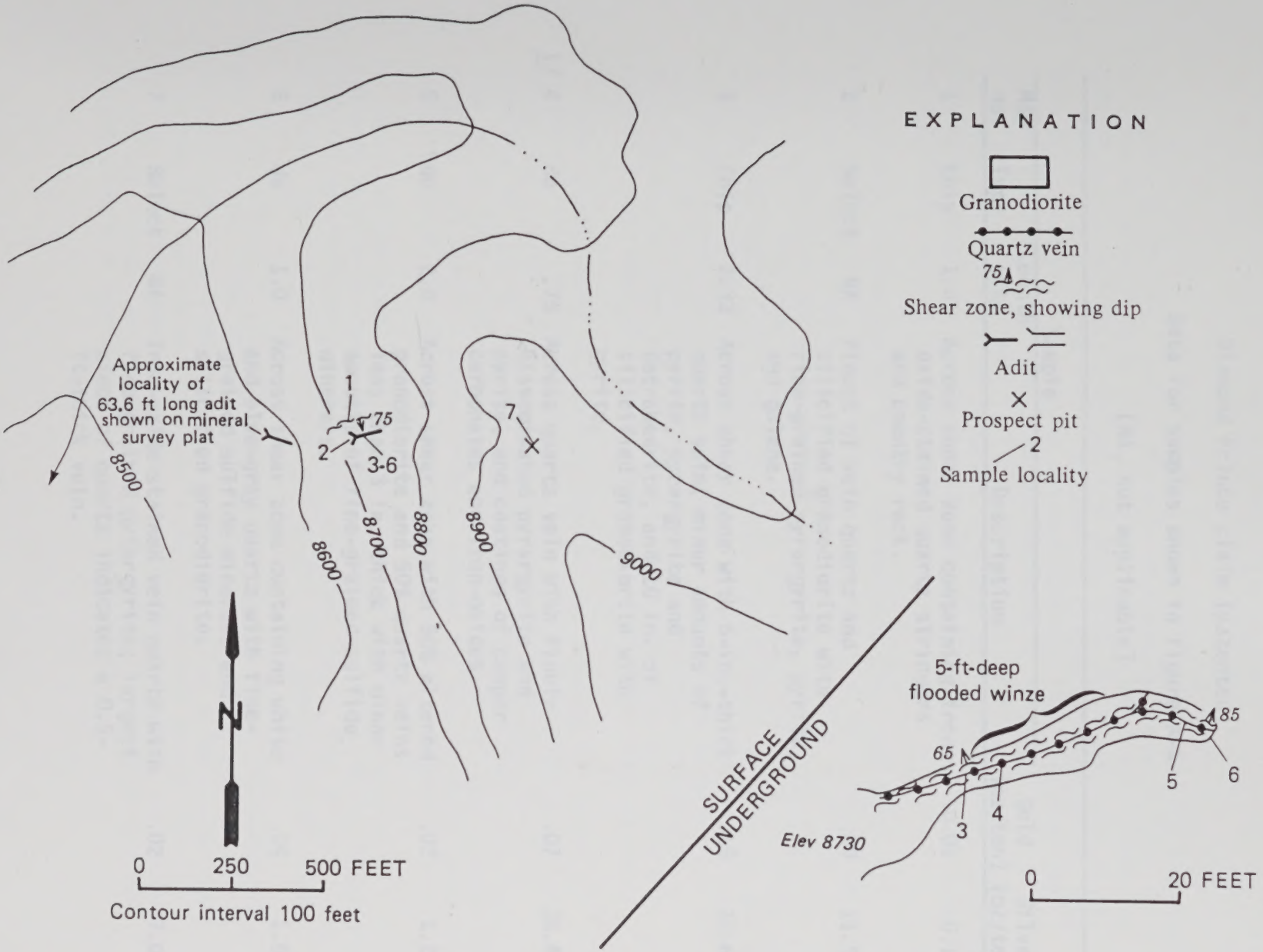


FIGURE A-6—Surface and underground map, Diamond Prince claim

Diamond Prince claim (patented)

Data for samples shown in figure A-6

[NA, not applicable]

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
1	Chip	1.0	Across shear zone containing iron-oxide-stained quartz stringers and country rock.	0.01	0.1
2	Select	NA	Pieces of vein quartz and silicified granodiorite with fine-grained pyrargyrite, pyrite, and galena.	.09	11.5
3	Chip	1.33	Across shear zone with 6-in.-thick quartz vein, minor amounts of pyrite, pyrargyrite and tetrahedrite, and 10 in. of silicified granodiorite with pyrite.	.15	10.6
1/ 4	do	.75	Across quartz vein with finely disseminated pyrargyrite and pyrite, and coatings of copper carbonates and iron-oxides.	.07	28.4
5	do	2.0	Across shear zone with 50% altered granodiorite and 50% quartz veins less than 3 in. thick with minor amounts of fine-grained sulfide minerals.	.02	1.2
6	do	1.0	Across shear zone containing white and blue-gray quartz with fine-grained sulfide minerals and silicified granodiorite.	.04	1.9
7	Select	NA	Iron-oxide-stained vein quartz with fine-grained pyrargyrite; largest piece of quartz indicates a 0.5-ft-thick vein.	.02	7.0

1/ Additional analysis: 0.078% copper.

Silver Leaf Nos. 1-3 Claims
(no. 27)

The Silver Leaf nos. 1-3 claims (pl. 1 and fig. 6, no. 27) are about 1 mi north of Marshall Peak. The main workings lie along a steep west-facing slope between 8,500 ft and 9,100 ft elevation. Claims are reached by crosscountry traverse 2 mi west from the Vienna mine at the end of the Smiley Creek road. At least 20 claims and relocations have been recorded for this vicinity between 1879 and 1907. In 1944 the Silver Leaf nos. 1-3 claims were located by R. T. Jaggers, later relocated by his daugthers F. Richardson and B. Martin, then leased to T. Williams, Sr. in 1984. No production records are available but, judging from select sample analyses of stockpiled rock, small amounts of material were probably shipped to nearby mills.

Jointed, coarse-grained quartz monzonite of the Idaho Batholith underlies the claims. The principal structure is a shear zone which strikes N. 55° to 75° W., dips 55° NE. to vertical, and is filled with quartz veins and highly iron-oxide-stained, crushed country rock (fig. A-7). This zone is traceable intermittently for 2,000 ft along strike, and ranges from 1 to 4 ft thick. Quartz veins in workings are as much as 1 ft thick and locally contain fine-grained pyrite, arsenopyrite, and argentiferous galena. On stockpiles, some sulfide minerals are as much as 0.25 in. across and coated partially by copper carbonates. Workings on the shear zone include a 172-ft-long adit, one caved adit (probably less than 50 ft long), and 60-ft- and 20-ft-long trenches.

The localities of 15 samples taken on the property are shown in figure A-7, and sample analyses are given in the accompanying table. Eight chip samples (fig. A-7, nos. 7-11 and 13-15) across the shear contained as much as 0.04 oz/ton gold and 4.0 oz/ton silver, and less than 0.1 percent copper, lead, or zinc. Most samples assayed a trace of gold and less than 0.4 oz/ton silver. Sample no. 12, selected from a 1-ton stockpile, contained 31.7 oz/ton silver and 0.249 percent lead.

North of the shear zone, a 2-in.- to 5-ft-thick quartz vein is explored by a 14-ft-long adit (fig. A-7, no. 1). The vein is composed of comb and massive quartz with pyrite and galena cubes, and it lies along a prominent joint which strikes N. 60° W. and dips steeply to the north.

A few pieces of a quartz pod crop out in a prospect pit southeast of the short adit. One select sample (fig. A-7, no. 5) of vein quartz at this pit contained 0.04 oz/ton gold and 24.5 oz/ton silver. Two small, sloughed pits at sample localities 4 and 6 have vein quartz and iron-oxide-stained quartz monzonite on the dumps; however, no structure is exposed. Sample no. 4 of vein quartz with coarse-grained sulfide minerals had 0.04 oz/ton gold and 59.6 oz/ton silver.

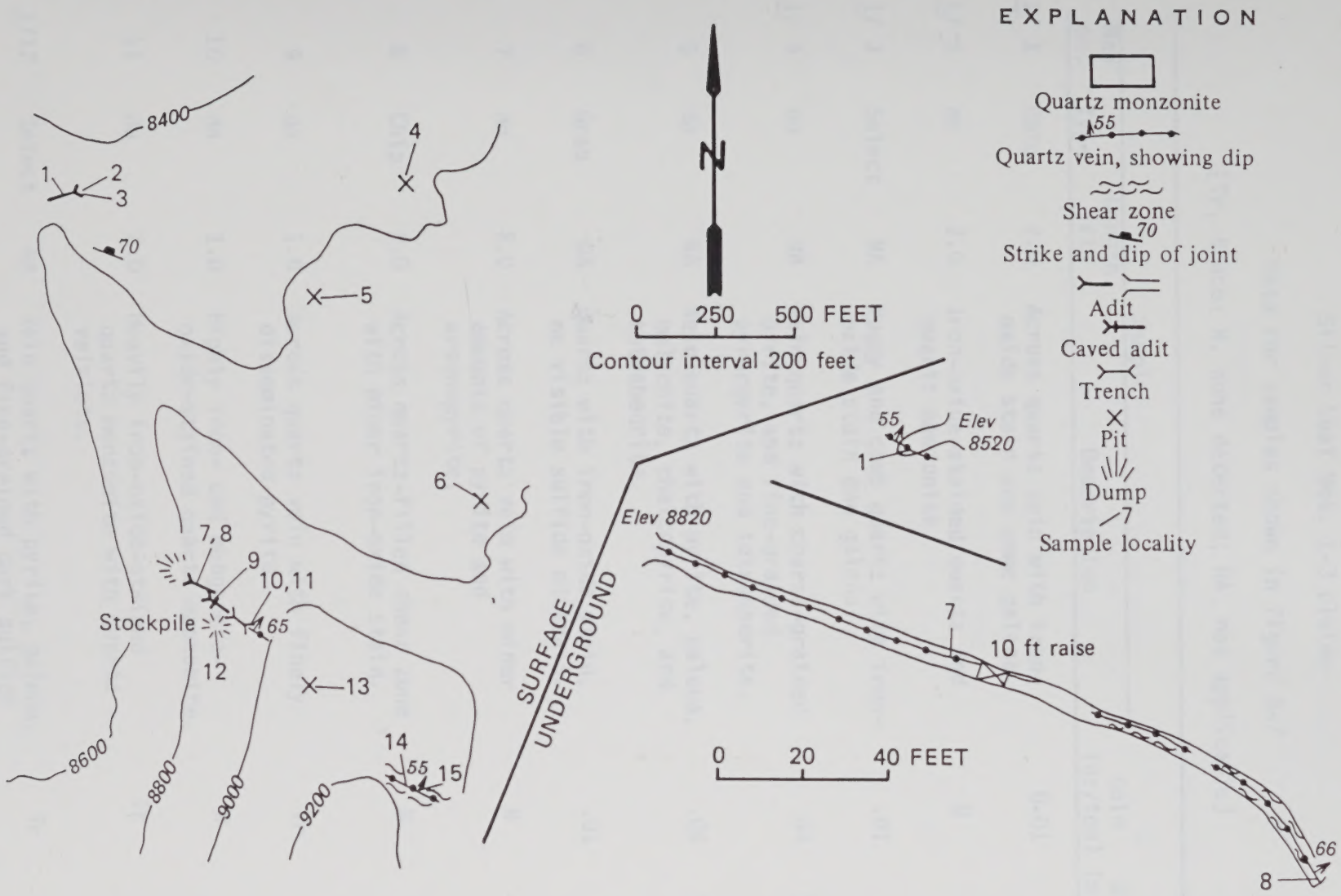


FIGURE A-7—Surface and undergound map, Silver Leaf claims

Silver Leaf Nos. 1-3 claims

Data for samples shown in figure A-7

[Tr, trace; N, none detected; NA, not applicable]

Sample				Gold (oz/ton)	Silver (oz/ton)
Map no.	Type	Length (ft)	Description		
1/ 1	Chip	2.5	Across quartz vein with iron-oxide stain and some galena.	0.01	0.4
1/ 2	do	2.0	Iron-oxide-stained quartz and quartz monzonite.	N	.01
1/ 3	Select	NA	Vuggy and comb quartz with iron-oxide stain and galena.	.01	1.2
1/ 4	do	NA	Vein quartz with coarse-grained pyrite, and fine-grained pyrargyrite and tetrahedrite.	.04	59.6
5	do	NA	Vein quartz with pyrite, galena, malachite, chalcopyrite, and tetrahedrite.	.04	24.5
6	Grab	NA	Quartz with iron-oxide stain, no visible sulfide minerals.	.01	.2
7	do	2.0	Across quartz vein with minor amounts of pyrite and arsenopyrite.	N	N
8	Chip	2.0	Across quartz-filled shear zone with minor iron-oxide stain.	N	.2
9	do	1.0	Across quartz vein with finely disseminated pyrite.	Tr	4.0
10	do	1.0	Highly iron- and manganese-oxide-stained quartz monzonite.	N	.4
11	do	2.0	Heavily iron-oxide-stained quartz monzonite with quartz veinlets.	Tr	.4
1/12	Select	NA	Vein quartz with pyrite, galena, and fine-grained dark sulfide minerals.	Tr	31.7

Silver Leaf Nos. 1-3 claims--Continued

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
13	Chip	1.5	Highly silicified, sheared, and iron-oxide-stained granitic rock with quartz stringers.	0.04	N
14	do	2.0	Across south part of 4.5-ft-thick quartz vein with iron- and manganese-oxide stain.	Tr	0.1
15	do	2.5	Across north part of 4.5-ft-thick quartz vein with iron- and manganese-oxide stain and pyrite.	.01	.4

1/ Additional significant analyses: sample 1, 0.37% lead
sample 3, 0.62% lead
sample 4, 0.10% copper, 0.21% lead
sample 5, 0.098% copper
sample 12, 0.25% lead

Select samples of shear zone material, and vein quartz at other workings, show localized high precious-metal concentrations. Although the principal zone is persistent, analyses of chip samples from very limited mineralized exposures are too low in grade to represent resources. However, analyses of select samples suggests that additional prospecting of this zone and other mineralized structures should reveal small tonnages of selectively minable vein quartz with high silver content.

Raymond and Aurora Claim Groups
(no. 30)

The Raymond nos. 1 and 2 claims (pl. 1 and fig. 6, no. 30) were located by R. T. Jaggers in 1944. Mr. Jaggers deeded the claims to his daughters F. Richardson and B. Martin who leased them to T. Williams, Sr., in 1984. Peripheral to these claims are the Aurora nos. 1-5 which were located by Williams and his sons in 1984. Both claim groups were current in September 1985. Mr. Williams (oral commun., 1985) states that original prospecting, including the driving of the upper adit (adit A, fig. A-8), probaby dates from the most active period in the Vienna district, 1879 to 1890. The first 110 ft of the lower adit were driven in the 1930's and the remainder during the summer of 1985. Access to these claims is by 7 mi of USFS and jeep roads south from Idaho State Highway 75.

On the Raymond claims, two adits (170 ft and 285 ft long) and one prospect pit are in biotite quartz monzonite of the Idaho Batholith (figs. A-8 and A-9). Workings at different levels intersect an 8 to 36 ft thick zone of silicified, sericitized, sheared, and sulfide-bearing country rock. The zone strikes N. 22° to 55° W. and dips 65° NE. to vertical. Silicification occurs as quartz veinlets and veins, some more than 2 ft thick, and quartz flooding. Pyrite is disseminated in both vein quartz and altered country rock. Pyrite-rich bands as much as 1 in. thick are in the quartz. Petrographic analysis of a highly mineralized sample also identified sphalerite, galena, argentite, and a lead-silver-antimony sulfide mineral. The argentite occurs as inclusions in pyrite and sphalerite, and as free grains in quartz.

No workings were observed on the Aurora claims, but there are five ridgetop exposures of shear zones and two of quartz veins (fig. A-8, nos. 17-26). These zones contain silicified quartz monzonite, chlorite, sericite, and iron-oxide stains. Structures have various orientations.

Eighteen chip, four random chip, two select, and one grab sample were taken. Sample localities are shown on figs. A-8 and A-9, and sample analyses are given on the accompanying table.

The mineralized zone exposed in the Raymond claim workings contains estimated 29,000 tons of inferred resource with a weighted average grade of 0.04 oz/ton gold and 0.3 oz/ton silver. The resource consists of two blocks within the mineralized zone. One block is assumed to be continuous for 120 ft downdip between the prospect pit and adit B, to extend one-half of the sampled length to the northwest and southeast, 120 ft total, and to average 20 ft thick. The second block, below adit B, is assummed to be 120 ft long (same as the first block), to extend downdip 60 ft (one-half the assumed length), and to average 9 ft thick. A tonnage factor of 12 ft^3/ton is used in both calculations. The analyses of 11 samples (nos. 3-7, 9-11, and 13-15) of zone material were weighted by sample length to determine grades.

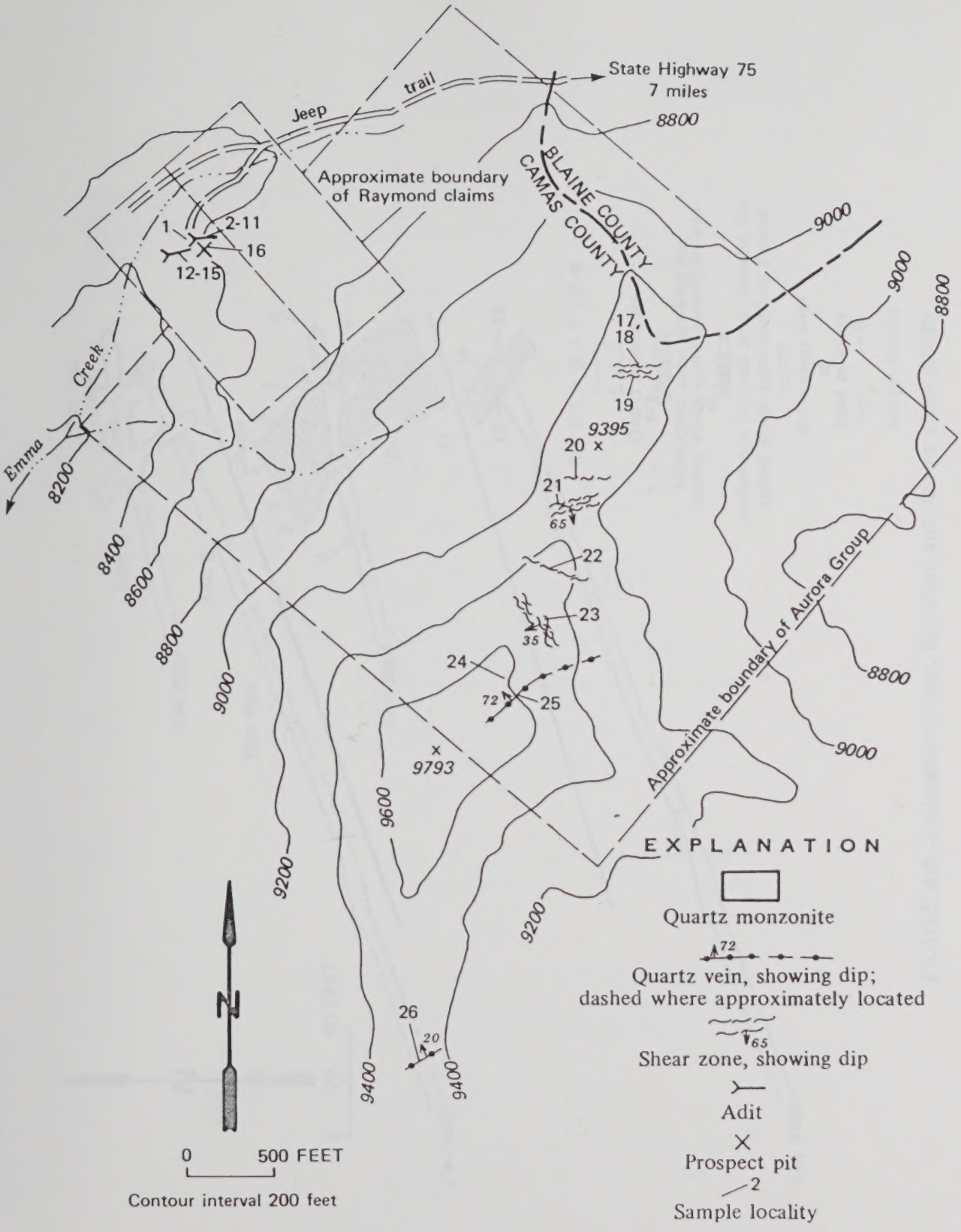


FIGURE A-8—Surface map, Raymond and Aurora claim group

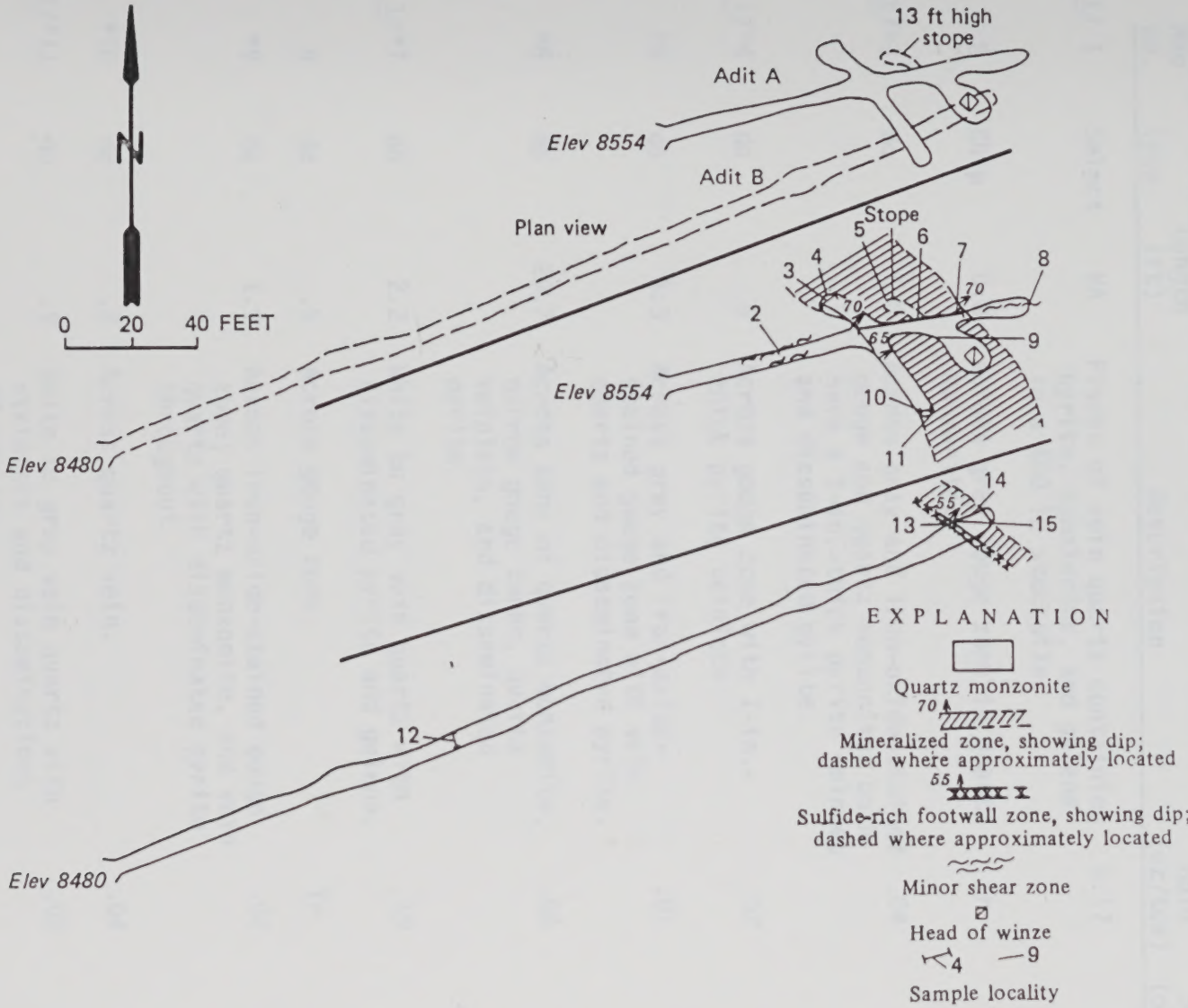


FIGURE A-9—Underground map, Raymond and Aurora claim groups

Raymond and Aurora claim groups
Data for samples shown in figures A-8 and A-9.
[Tr, trace; N, none detected; NA, not applicable]

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
1/ 1	Select	NA	Pieces of vein quartz containing pyrite, sphalerite, and galena in a 400 lb stockpile.	0.17	19.5
2	Chip	0.8	Across gray gouge zone in quartz monzonite.	Tr	N
1/*3	do	6.0	Across gray and iron-oxide-stained gouge and quartz monzonite; both have a 1-in.-thick pyrite veinlet and disseminated pyrite.	.04	.7
1/*4	do	.5	Across gouge zone with 1-in.-thick pyrite veinlets.	.02	.6
*5	do	3.3	Across gray and iron-oxide-stained gouge zone with vein quartz and disseminated pyrite.	.01	.1
*6	do	29.7	Across zone of quartz monzonite, narrow gouge zones, quartz veinlets, and disseminated pyrite.	.04	.4
1/*7	do	2.2	White to gray vein quartz with disseminated pyrite and galena.	.19	.5
8	do	.5	Across gouge zone.	Tr	N
*9	do	1.9	Across iron-oxide-stained gouge zone; quartz monzonite, and vein quartz with disseminated pyrite throughout.	.02	.1
*10	do	.2	Across quartz vein.	.04	N
1/*11	do	.9	White to gray vein quartz with stringers and disseminations of pyrite.	.02	1.1
12	do	4.0	Biotite quartz monzonite.	N	.2

Raymond and Aurora claim groups--Continued

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
1/*13	Chip	0.7	White to gray quartz with pyrite stringers in a gouge zone.	0.048	0.20
*14	do	1.0	Across gouge zone with disseminated pyrite.	.004	.029
*15	do	8.0	Across zone of chloritized quartz monzonite, quartz veins and veinlets, and disseminated pyrite.	.008	.023
1/ 16	Grab	NA	White and gray vein quartz with pyrite, minor amounts of galena and heavy iron-oxide stain.	.08	2.7
17	Select	NA	Pieces of quartz in gouge zone.	N	N
18	Random chip	50.0	Across iron-oxide-rich gouge zone with vein quartz and chloritized quartz monzonite.	N	N
19	do	8.0	Iron-oxide-stained, silicified, and chloritized quartz monzonite with limonite pseudomorphs after pyrite.	N	N
20	Chip	1.2	Silicified and chloritized quartz monzonite within a larger crushed zone.	N	N
21	Random chip	38.0	Iron-oxide-stained quartz monzonite and some vein quartz.	Tr	N
22	Chip	.4	Iron-oxide-stained and silicified quartz monzonite.	N	N
23	Random chip	30.0	Iron-oxide-stained quartz monzonite with some vein quartz.	N	N
1/24	Chip	5.0	Across zone of vein quartz with massive sphalerite blebs and some quartz monzonite.	Tr	N
25	Grab	NA	Loose material from iron-oxide-stained vein quartz and some quartz monzonite.	N	N

Raymond and Aurora claim groups--Continued

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
26	Chip	5.0	Vein quartz with iron-oxide stain along fractures.	Tr	N

* Samples used to calculate tonnage and grade.
1/ Additional significant analyses: Sample no. 1 - 1.7% lead, 6.0% zinc
3 - 0.16% lead, 0.68% zinc
4 - 0.25% zinc
7 - 0.16% lead
11 - 0.21% zinc
13 - 0.23% lead
16 - 0.21% lead
24 - 5.7% zinc

The mineralized zone contains a small, subeconomic low-grade gold and silver resource. The average value of the resources is about $18/ton (computed using a gold price of $400/oz and a silver price of $6/oz). This value for near-surface, gold-silver-bearing material approaches minability by low-cost, open-pit mining and heap leaching. Additional prospecting is likely to identify a larger tonnage.

Mountain King Mine
(no. 33)

The Mountain King mine (pl. 1 and fig. 6, no. 33) includes seven claims and one millsite that are within the north addition and 500 ft outside of the study area. Workings are on the Mountain King and Zinco claims (fig. A-10). The property, just east of Mule Creek, is accessible from State Idaho Highway 75 by 14 mi of USFS roads and a rough mine road. Prospecting probably began in the 1880's contemporaneous with mining in the nearby Vienna district. The claims have been held by Marvin Johnson and his family since the early 1940's (oral commun., 1985). Small tonnages of silver-zinc-lead ore were likely produced, but verifiable records are not available.

The claim area is underlain by dark gray phyllitic argillite with interbedded dolomite and limestone intruded locally by latite dikes. These rocks occur as a roof pendant surrounded by granitic rocks of the Idaho Batholith. Mineralized shear zones ranging from 1 to 4 ft thick cut the sedimentary rocks (fig. A-10), and replacement bodies occur in calcareous portions of the rocks. Within shear zones are 0.5- to 2-ft-thick mineralized veins of white quartz, siliceous boxwork, iron-oxide-stained gouge, and blebs and disseminations of sphalerite, galena, and pyrite. The attitudes of the zones range widely. On the Mountain King claim, the open adit is driven on a sulfide-bearing vein which trends to the east with dips steeply to the south. A zone exposed in a trench wall (fig. A-10, no. 1-3) strikes N 20° to 30° W. and dips 15° to 50° NE. Zinco claim workings explore a 1- to 3.2-ft-thick shear zone and vein which are on the hanging wall of a porphyritic latite dike which strikes N. 20° W. and dips 35° to 55° NE.

Sample localities of 12 chip and 2 select samples are shown on figure A-10, and sample analyses are listed on the accompanying table. Chip samples across mineralized portions of zones on the Mountain King claim contained as much as 0.03 oz/ton gold, 6.0 oz/ton silver, 14.7 percent zinc, and 5.5 percent lead. One select sample (fig. A-10, no. 4) from the dump at the caved adit had 2.7 oz/ton silver, 23.0 percent zinc, and 2.0 percent lead. The dump represents about 50 ft of workings. Of six chip samples on the Zinco claim structures, only one (no. 9) in the inclined shaft contains significant silver, zinc, and lead concentrations.

An occurrence of at least 30 tons of silver-zinc-lead material is on adit dumps on the Mountain King claim. Exposed, mineralized portions of shear zones are too discontinuous for resource calculations. Silver, zinc, lead, and gold content in samples from the claim suggest material of sufficient grade to be minable by underground mining methods, if a sufficient tonnage is delineated. Further examination for mineralized structure extensions is warranted on this claim.

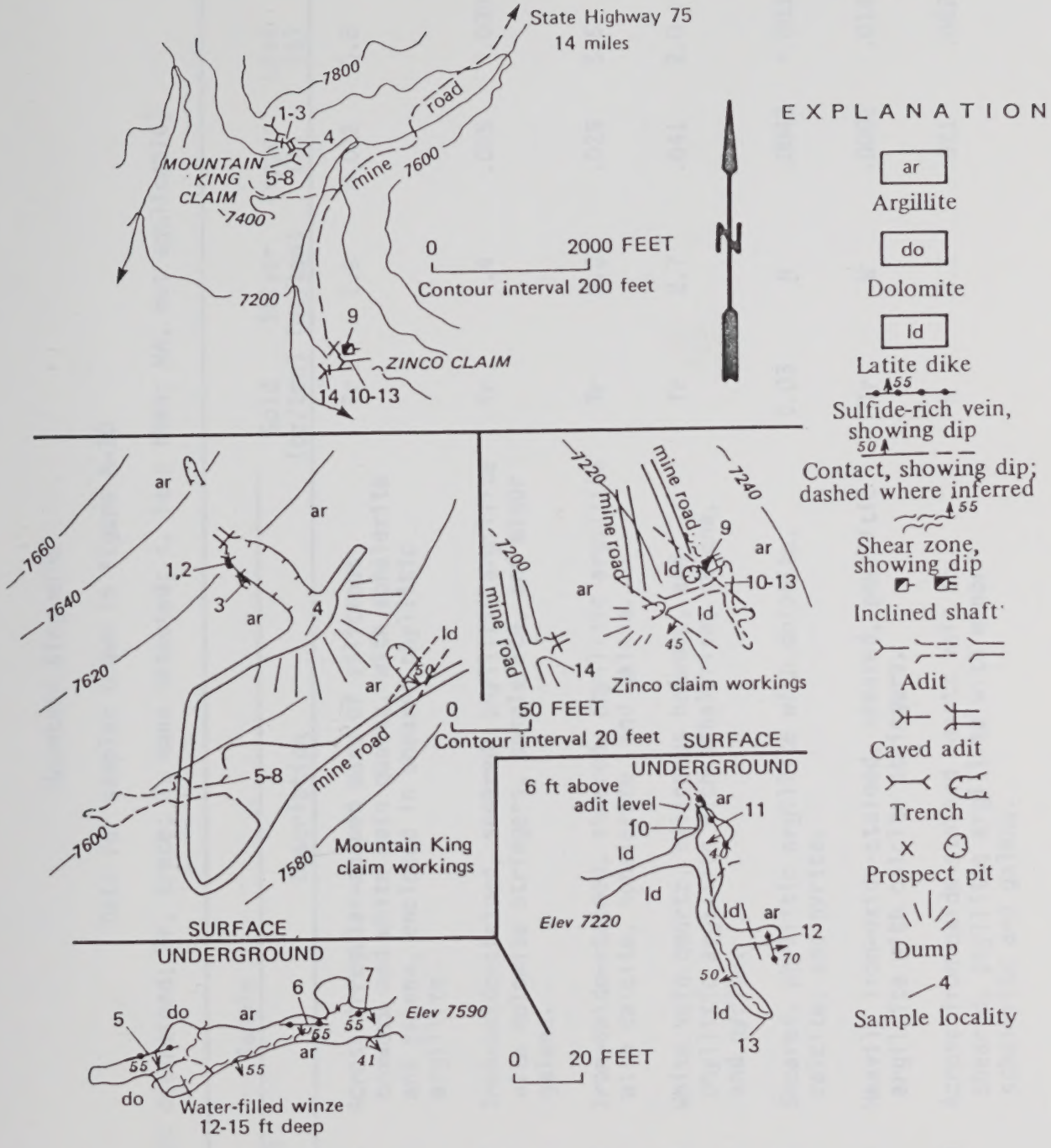


FIGURE A-10—Surface and underground map, Mountain King mine

Mountain King mine

Data for samples shown in figure A-10

[--, not determined; Tr, trace; N, none detected; <, less than; NA, not applicable]

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)	Copper (%)	Lead (%)	Zinc (%)
1	Chip	2.5	Across irregular-shaped mass of siliceous boxwork and white vein quartz, with sphalerite and galena, enclosed in sheared phyllitic argillite.	Tr	1.9	0.022	0.8	8.7
2	do	2.0	Iron-oxide-stained, sheared, phyllitic argillite with dolomite stringers, sphalerite, and minor galena.	Tr	.4	.025	.039	14.7
3	do	1.2	Iron-oxide-stained, sheared, phyllitic argillite with calcite, sphalerite, and galena.	Tr	6.0	.029	5.5	6.7
4	Select	NA	White vein quartz, siliceous boxwork, and phyllitic argillite with sphalerite, galena, and pyrite.	Tr	2.7	.041	2.0	23.0
5	Chip	2.0	Sheared, phyllitic argillite with dolomite, calcite, and pyrite.	0.03	N	.0043	<.003	.055
6	do	.5	Heavily iron-oxide-stained, sheared, phyllitic argillite with calcite stringers.	Tr	N	.0062	.014	2.19
7	do	1.0	Across iron-oxide-stained quartz vein in sheared, phyllitic argillite with minor sphalerite and galena.	N	3.1	.021	.082	.52

Mountain King mine--Continued

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)	Copper (%)	Lead (%)	Zinc (%)
8	Chip	2.0	Iron-oxide-stained, sheared, phyllitic argillite.	0.01	0.1	0.006	0.059	0.55
9	do	1.0	Heavily iron-oxide-stained, sheared, phyllitic argillite with sphalerite and galena, and some siliceous boxwork.	.02	2.2	.018	3.2	13.1
10	do	3.2	Highly fractured and sheared phyllitic argillite with calcite, dolomite, and iron stain on fractured surfaces.	Tr	.1	.0066	.51	.223
11	do	2.0	Highly fractured and sheared phyllitic argillite with calcite stringers and finely disseminated pyrite.	N	N	.0026	<.003	.019
12	do	1.0	Phyllitic argillite with calcite, quartz, and disseminations and blebs of pyrite.	Tr	N	.0026	.0057	.046
13	do	3.0	Across fractured, chloritized porphyritic dike.	Tr	N	--	--	--
14	Select	NA	Phyllitic argillite with calcite stringers and finely disseminated pyrite.	Tr	.1	--	--	--

Susan Prospect
(no. 35)

The Susan prospect (pl. 1 and fig. 6, no. 35) lies along a steep, west-facing slope at an elevation of 9,500 ft and about 1 mi northeast of Miner Lake. Access is by 4 mi of pack trail from the end of Prairie Creek road, then a steep 0.5 mi ascent. According to a notice posted near the shaft, the claim was located in August 1955 by Ernest and Raymond Lomas. Original staking may date back to the early 1900's, based on the condition of workings and on-site mining equipment. As of September 1985, no claims were held in the vicinity. Production records are not available, but small amounts of vein material were probably packed to the smelter at Galena or Ketchum.

A fissure-filled vein cuts dacite of Tertiary age, and a block of silicified argillite crops out above prospect workings. The 1.5- to 5-ft-thick vein strikes N. 60° E. and dips 15° to 55° SE. This structure, exposed for 45 ft along strike and dip slope, is offset by two northeast-trending normal faults. The vein contains brecciated and silicified country rock, 1- to 2-in.-thick stringers of quartz, and blebs of pyrite, galena, sphalerite, and arsenopyrite. Pervasive iron oxide and small amounts of copper carbonate stain the vein.

A 45-ft-deep shaft inclined 25° to the northeast exposes the vein along its northern wall. A fault which strikes N. 60° E. and dips 50° NW. truncates the vein along the opposite wall. North of the shaft is a small prospect pit, and to the south is a collapsed shallow shaft. Both workings are on dip slope vein exposures about 45 ft apart.

Eight chip samples, four from the inclined shaft, were taken across the vein. A 1-ft-long sample from the shaft contained 6.60 oz/ton silver, 5.34 percent lead, 5.40 percent zinc, and 0.0456 percent cadmium. Other samples had as much as 0.32 oz/ton silver, 0.276 percent lead, 1.43 percent zinc, 0.016 percent copper, and less than 0.002 oz/ton gold. Except for one sample, the analyses show silver-lead-zinc content is too low to be minable by underground mining methods that would be required at the vein. However, additional prospecting in this vicinity may reveal vein extensions or other veins with highly mineralized shoots or pods.

Newman Creek Prospect
(no. 38)

The Newman Creek prospect (pl. 1 and fig. 6, no. 38), just east and outside of the study area border, is on the ridge between Norton and Newman Creeks. It is reached by a 1-mi-long, 2,000 ft climb north from the Baker Lake road. Blaine County mining claim records for this vicinity are too vague to identify a claim name and date. No claims were current in 1985.

A 0.5-acre roof pendant of interbedded Paleozoic argillite, limestone, and quartzite overlies dacite porphyry of Tertiary age. The highly fractured sedimentary rocks exposed in the adit (fig. A-11) contain finely disseminated galena and sphalerite. Elsewhere these rocks have only minor amounts of pyrite. Exposed near the adit portal (fig. A-11, sample no. 1) is a 6-ft-diameter tactite pod with massive quartz, chloritized argillite, iron- and manganese-oxides, and about 5 percent combined pyrite, galena, and sphalerite. Stockpiles of about 300 and 100 lb of tactite material on dumps of upper workings suggest similar small tactite pods were mined. Stockpiled tactite contains vitreous and vuggy quartz, epidote, pyrite, argentite, malachite and azurite.

Localities of four chip samples and one select sample are shown on fig. A-11. One 6-ft-long chip sample (no. 1) across the tactite pod near the lower adit and one select sample (no. 5) of stockpiled tactite at the upper workings contained 1.2 and 0.298 oz/ton silver, 3.59 and 1.24 percent lead, and 1.30 and 0.1 percent zinc, respectively. Two 17-ft-long chip samples (nos. 2 and 3) across the bedding of the sulfide-bearing argillite, taken mostly in the adit, averaged 0.77 oz/ton silver, 2.5 percent lead, and 1.3 percent zinc. No other exposures of similarly mineralized argillite were found at the prospect. A sample (no. 4) of argillite near the caved upper adit had low precious and base metal values. Gold content in all samples was less than 0.002 oz/ton.

About 400 lb of tactite material is stockpiled. Further exploration should reveal additional tactite pods, as well as more lead-zinc-rich zones in argillite, in this pendant and in other pendants to the west, in the study area. However, sample analyses indicate metal concentrations are too scattered and too low to be minable.

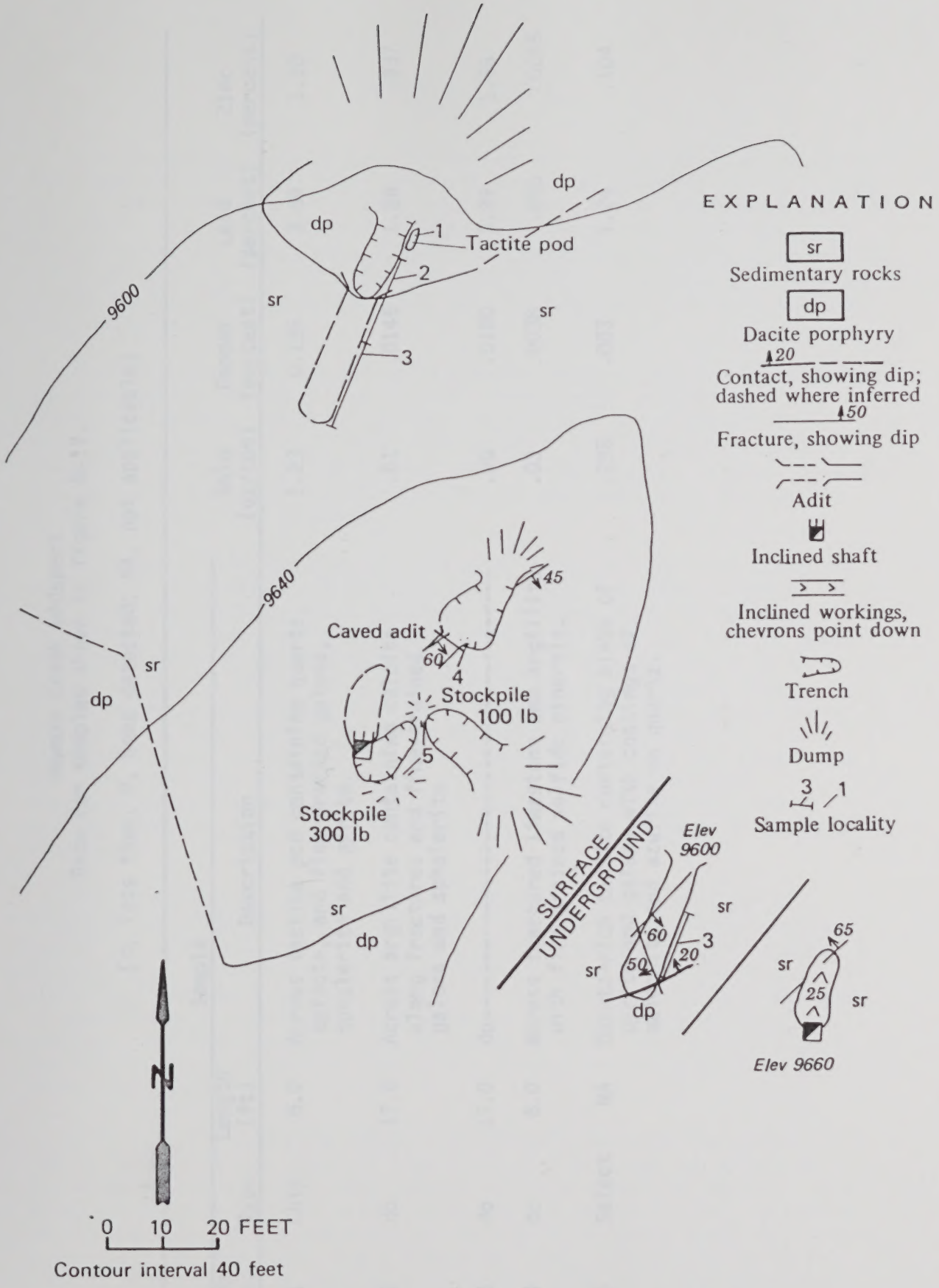


FIGURE A-11—Surface and underground map, Newman Creek prospect

Newman Creek prospect
Data for samples shown in figure A-11.

[<, less than; N, none detected; NA, not applicable]

Map no.	Sample Type	Length (ft)	Description	Gold (oz/ton)	Copper (percent)	Lead (percent)	Zinc (percent)
1	Chip	6.0	Across tactite pod containing quartz, epidote, and fine grained galena, sphalerite and pyrite.	1.23	0.126	3.59	1.30
2	do	17.0	Across argillite containing calcite along fractures and fine-grained galena and sphalerite	.61	.0145	1.28	.937
3	do	17.0	do----------	.90	.0180	3.89	1.58
4	do	6.0	Across fractured limestone and argillite with fine grained sulfide minerals.	.03	.0038	.055	.0265
5	Select	NA	Quartz-rich tactite containing blebs of pyrite and galena with coatings of malachite and azurite on quartz.	.298	.083	1.24	.104

Horseshoe Prospect
(no. 43)

The Horseshoe prospect (pl. 1 and fig. 6, no. 43) is in a cirque on the south side of Baker Peak, adjacent to the study area. It is reached by 4 mi of crosscountry traverse from the end of the Baker Creek road or by trail a similar distance from the Warm Springs road. The original date of location is not known, but is believed, based on the condition of many workings, to have been in the early 1900's. In 1970, Ed and Leroy Strout located the Horseshoe nos. 1 and 2 claims and continued to hold the claims in 1985.

Tertiary granodiorite and quartz monzonite crop out in cirque walls surrounding the prospect (fig. A-12). These rocks are cut by northwest-trending, steeply dipping, mineralized shear zones. A northeast-trending breccia zone with granitic and sedimentary rock fragments is exposed on the eastern wall of the cirque. Glacial deposits occupy the central portion of the prospect and cover most mineralized shear zones near the workings.

Five inaccessible adits, six prospect pits, and one trench explore the shear. The adits, all caved at the portal, are each estimated to be less than 100 ft long. Pits are 5 to 15 ft long, 5 to 10 ft wide, and less than 5 ft deep, and the trench is 30 ft by 6 ft and is 5 ft deep. Short exposures of shear-zone segments at the workings are 2 to 5 ft thick, strike N. 10° to 35° W. and dip 75° NE. to vertical. Most of the shear zones contain silicified granitic rock, and narrow quartz veins and stringers with finely disseminated sulfide minerals. Heavy iron-oxide stain is pervasive in the zones. One pod in the shear zone, at sample locality 14 (fig. A-12), contains vuggy quartz with coarse-grained sphalerite, galena, pyrite, and arsenopyrite. These sulfide minerals are usually fine-grained on dumps of many of the other workings.

The breccia zone, about 1,000 ft thick, is composed mostly of fragments of granitic rocks, quartzite, and siltstone. East-trending quartz veins from 2 to 4 ft thick are on the ridge at sample locality 4 (fig. A-12). The iron-oxide-stained breccia zone is locally highly silicified and contains small amounts of fine-grained pyrite. The zone is explored by a caved adit, estimated to have less than 50 ft of workings, and four prospect pits 20 ft by 10 ft or less and 4 ft deep. The structure may be on the edge of a cauldron projected by Hall and MacIntrye (1986).

Thirteen chip and nine select samples were taken at the prospect. Sample localities are shown on fig. A-12, and analyses are given in the accompanying table. Five chip samples of shear zones in granitic rocks contained as much as 0.04 oz/ton gold and 1.5 oz/ton silver. Selected shear zone material on dumps had as much as 0.12 oz/ton gold, 6.7 oz/ton silver, 2.2 percent lead, and 1.9 percent zinc. Eight samples in the breccia zone assayed as much as 0.03 oz/ton gold and 0.5 oz/ton silver.

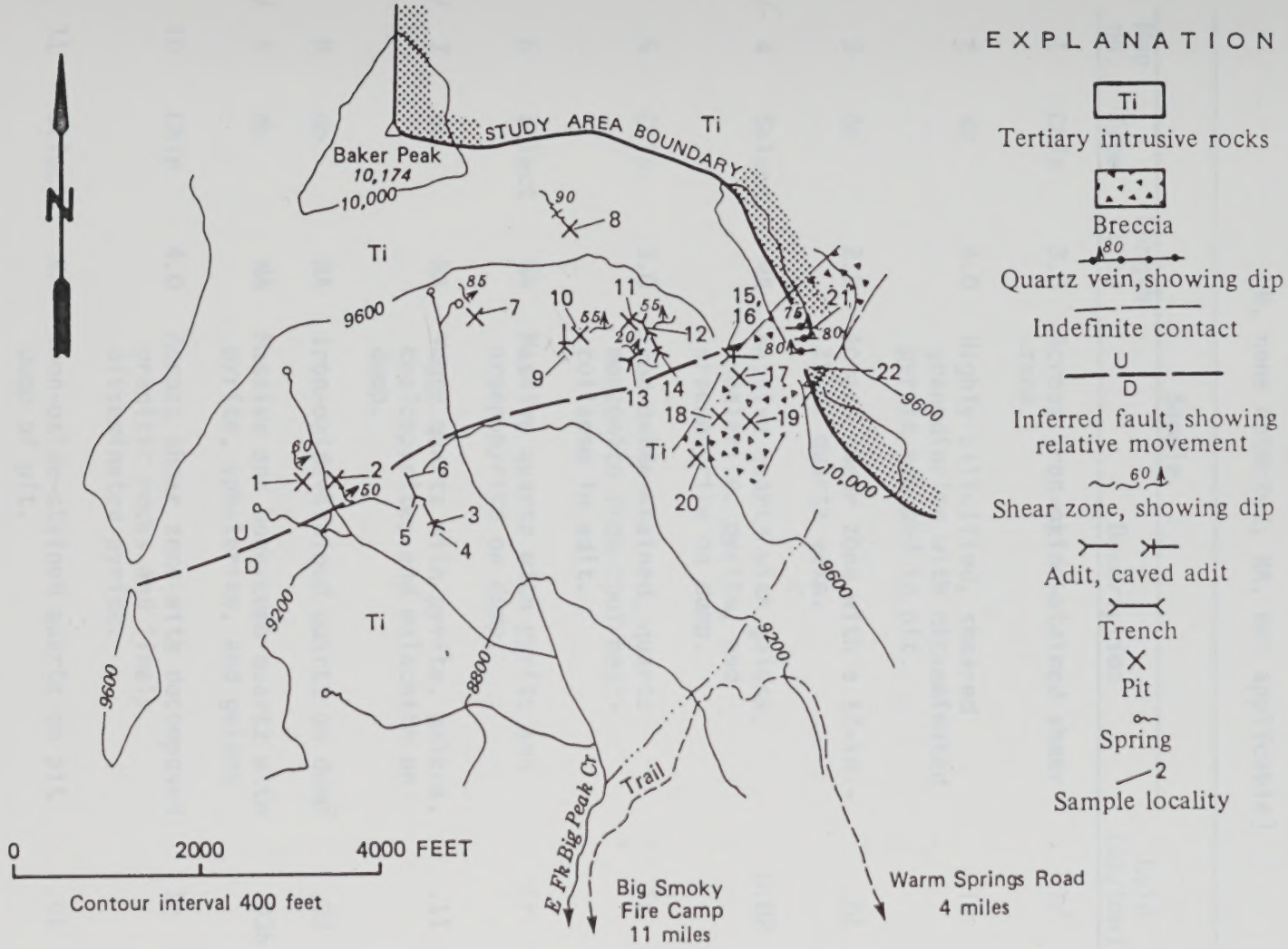


FIGURE A-12—Surface map, Horseshoe prospect

Horseshoe prospect

Data for samples shown in figure A-12.

[N, none detected; NA, not applicable]

	Sample				Gold (oz/ton)	Silver (oz/ton)
	Map no.	Type	Length (ft)	Description		
	1	Chip	3.0	Across iron-oxide-stained shear zone.	Tr	N
	2	do	4.0	Highly silicified, sheared granodiorite with disseminated pyrite exposed in pit.	Tr	0.076
	3	do	2.2	Across shear zone with a 12-in.-thick quartz vein.	.01	.3
1/	4	Select	NA	Massive quartz with galena, sphalerite, pyrite, and arsenopyrite on dump.	0.02	5.2
	5	Chip	3.0	Iron-oxide-stained, quartz monzonite from roof near collapse in adit.	Tr	N
	6	Select	NA	Massive quartz with pyrite and arsenopyrite on dump.	Tr	N
1/	7	do	NA	Vuggy quartz with pyrite, galena, chalcopyrite, and malachite on dump.	.11	6.7
	8	do	NA	Iron-oxide-stained quartz on dump	.03	.2
1/	9	do	NA	Massive and honeycomb quartz with pyrite, sphalerite, and galena	.036	.79
	10	Chip	4.0	Across shear zone with decomposed granitic rocks and finely disseminated pyrite.	Tr	.03
	11	Select	NA	Iron-oxide-stained quartz on pit dump of pit.	.01	N
1/	12	do	NA	Brecciated material with coarse-grained sphalerite, galena, and pyrite on dump.	.12	.2

Horseshoe prospect--Continued

Map no.	Type	Sample Length (ft)	Description	Gold (oz/ton)	Silver (oz/ton)
1/ 13	Chip	1.0	Across shear zone with pod of galena and pyrite near adit portal.	0.04	1.5
1/ 14	Select	NA	Vuggy quartz with galena, sphalerite, pyrite, and arsenopyrite on dump.	.12	3.9
15	Grab	NA	Highly iron-oxide-stained, brecciated material with pyrite from breccia zone.	.02	.1
16	Chip	4.5	Highly iron-oxide-stained material in breccia zone.	.02	.2
17	do	1.5	Across shear zone and silicified breccia.	.01	.1
18	do	5.5	Across iron-oxide-stained segment of breccia zone with minor fluorite crystals.	Tr	N
19	do	2.0	Across segment of breccia zone with quartz and metasedimentary rock fragments.	Tr	N
20	Grab	NA	Highly iron-oxide-stained material from dump of pit.	.03	.5
21	Chip	5.0	Across two, subparallel quartz veins in breccia zone.	Tr	.02
22	Chip	2.0	Rehealed quartz with disseminated pyrite in quartzite portion of breccia zone.	Tr	.04

1/ Additional significant analyses: Sample no. 5 - 0.12% copper, 1.4% lead, 1.5% zinc
7 - 2.2% lead, 0.17% zinc
9 - 0.37% lead, 0.15% zinc
12 - 0.62% lead, 1.0% zinc
13 - 2.3% lead
14 - 1.8% lead, 1.9% zinc

The grades of the chip sample analyses are too low for the material to be minable by underground mining methods that would be required at the shear zones. The breccia zone could be of minable grade if a large tonnage could be developed and mined by open-pit methods. Analyses of select samples suggests that ore-grade gold-silver resources, with byproduct lead-zinc, occur in shoots or pods in the shear zones. Additional exploration for large tonnage/low grade gold-silver resources in the breccia zone and poorly exposed shear zones is highly recommended.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID

[*, outside the study area; underlined names refer to properties which warrant additional investigation for resources; those not underlined have little apparent significance or are too poorly exposed to permit evaluation]

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
1	This Is It claims (current claims)	This Is It nos. 1-5 claims were located by Richard Knoblock in 1970 and 1973. In 1985 all were current except no. 5. Two massive, fissure-filled quartz veins intrude quartz monzonite at the property. The most extensively exposed vein strikes N. 20° to 45° W., dips 28° to 55° NE., and is traceable in outcrops, workings, and talus for 2,000 ft along strike. It is 1.5 to 7.0 ft thick and contains randomly occurring pods, most less than 2 ft in diameter, of pyrite, arsenopyrite, galena, and sphalerite. A second vein, about 500 ft south of the main one, strikes N. 65° W. and dips 50° NE. It is generally less than 2 ft thick, is exposed along strike for 300 ft, and contains sulfide minerals similar in content and distribution to the main vein.	Five pits and two trenches are on the main vein. Pits are less than 6 ft in diameter, and the largest trench is 20 ft long by 6 ft wide. Two small pits are on the second vein. All workings are partially to completely sloughed. No mineral production is known.	Seven chip and five select samples were taken; nine from the main vein and three from the second vein. Three of five chip samples as long as 2 ft across the main vein contained 1.8 to 7.0 oz/ton silver. Of these, the sample with the most visible galena and sphalerite had 1.8% lead and 0.92% zinc. The highest gold content for all samples of the main vein was 0.01 oz/ton. Two chip samples of the second vein had as much as 0.01 oz/ton gold, 2.7 oz/ton silver, 1.3% lead, and 0.76% zinc. One select sample contained 0.15 oz/ton gold, 0.7 oz/ton silver, 0.84% lead, and 0.015% zinc. Mineralized pods are randomly distributed along the vein; however, metal content in samples indicate a grade too low to be minable by underground techniques. Further exploration of the veins to depth and along strike toward the study area is likely to reveal additional mineralized pods, some of which may constitute resources.
3	Cliff prospect	Numerous iron-oxide-stained zones of silicified and sericitized granitic rocks of the Idaho Batholith, and light-colored pegmatite dikes, underlie the prospect. Zones commonly contain white quartz veins, as much as 3 ft thick, and quartz veinlets, disseminated pyrite, iron-oxide pseudomorphs after pyrite, and comb quartz. One en echelon zone, which strikes northeast and dips steeply to the northwest, is observed to extend for over 2,000 ft along strike. Another zone, as much as 40 ft thick, strikes east and contains oblique, crosscutting white quartz lenses as much as 3 ft thick. Several small cuspate blebs of ruby silver (pyrargyrite) were seen in one quartz lens. Other mineralized zones have a dominantly west or northwest trend with north or northeast dips.	No workings were found.	Two select, four random chip, and seven chip samples were taken. One select sample with fine grained ruby silver in a narrow quartz lens contained 4.3 oz/ton silver and 0.50% lead. The other select sample had 3.56 oz/ton silver and 0.406% lead. The remaining samples have no significant concentrations of precious or base metals. Sample data, including the select sample analysis, indicate the material is below minable grade for the necessary underground mining methods.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
4	Cumberland prospect	The prospect was located prior to 1886. Subsequent recorded claims used the Cumberland as a reference point. William Morris held the claim from 1980 to 1984; however, it was not current in 1985. Dump material of a caved adit indicates a quartz vein and diabase dike cutting quartz monzonite were explored. The vein crops out locally along strike for 1,000 ft westerly from the adit. It is 3 to 14 ft thick and enclosed in a silicified zone as much as 25 ft thick. Both structures strike N. 75° to 85° E. and dip 75° NW. to vertical. Vein material consists of massive quartz and minor amounts of comb quartz with finely disseminated pyrite and heavy iron-oxide stain. The diabase dike crops out 1,000 ft north of the adit, where it has a northwest trend and near vertical dip. Continuation of the dike to the adit is verified by adit dump material which is comprised of one-third highly iron-oxide-stained, chloritized diabase.	One caved adit, started in a southerly direction, is estimated by dump size to have over 100 ft of workings. Two prospect pits had been dug. The upper pit on the vein is 16 ft by 14 ft and 5 ft deep, and the lower pit across the silicified zone is 15 ft by 4 ft and 4 ft deep. No production was recorded.	Four chip and five select samples were taken. Three chip samples across the quartz vein and one sample of the silicified zone assayed a maximum of 0.01 oz/ton gold and no silver. Five select samples of five types of dump material showed only traces of gold and silver. Assay results indicate that the material is not minable and resources are not likely.
5	Lee prospect	The prospect is named for the 38 Lee lode claims located in this vicinity in 1979 by Bolero Mines. The claims are not current. A former claim, the DHD, was located in 1964 in the southwest part of this group (Kiilsgaard and others, 1970, p. D105). The prospect, which is underlain by granitic rocks of the Idaho Batholith, covers an area with numerous mineralized zones from 1 to 20 ft thick and commonly over 100 ft long. Zones have compositions ranging from sericitized and silicified country rock to massive white quartz, with some comb quartz. Iron-oxide pseudomorphs after pyrite, disseminated pyrite, and minor amounts of galena occur mainly in the quartz. The zones strike N. 70° E. to N. 85° W. and dip 45° N. to vertical.	One caved, west-trending adit is estimated to have been 100 ft long (Kiilsgaard and others, 1970, p, D105); no production is recorded.	Eleven chip samples and one select sample were taken. The select sample, from the caved adit, contained 1.4 oz/ton silver and 0.33% lead. Of the remaining samples taken from mineralized zones, six had silver content ranging from 0.1 oz/ton to 0.3 oz/ton, and four samples had a trace gold. Zones north of Ross Fork are better exposed, but sample analyses indicate the grade is too low to merit further investigation.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
6	Rex prospect	Groups of claims were located in the prospect vicinity in 1902 and 1905. No claims are currently held in this area. En echelon segments of a northwest-trending shear zone are exposed intermittently for 1,600 ft in quartz monzonite and diorite. Zone exposures range from 4 to 15 ft thick, strike N. 20° to 50° W., dip 15° to 60° NE., are composed of highly brecciated and iron-oxide-stained country rock, and have a silicified core. The core contains massive crystalline quartz with lesser amounts of blue-gray quartz, and ranges in thickness from a few inches to 7 ft. Finely disseminated pyrite and arsenopyrite locally comprise 2% to 4% of the core.	Two, 3-ft-deep prospect pits are in the central part of the zone. One is 10 ft in diameter, and the other is 25 ft by 10 ft.	Eleven chip samples of the shear zone and core, and one select sample of sulfide-bearing core material, were taken. Eight of eleven samples of the zone and core contained between 0.01 and 0.04 oz/ton gold; the select sample had 0.01 oz/ton gold. Silver content was mostly nil. Sample analyses indicate that gold and silver content of the shear zone is too low to be minable by underground mining methods.
8	Gold Run Creek prospect	The prospect is underlain by quartz monzonite of the Idaho Batholith. A small pit exposes a 2.5-ft-thick, northwest-trending, massive quartz vein with minor comb quartz. Fracture surfaces are iron-oxide stained. Pieces of vein quartz are scattered around another small pit which lies about 2,000 ft to the east.	Two shallow prospect pits are less than 10 ft in diameter.	One chip sample across the vein exposure and one select sample of vein quartz around the eastern pit contained no gold, silver, or significant concentrations of base metals.
9	John L placer claims (current claims)	The John L and John L no. 1 placer claims, extending the length of Johnson Creek, were located in 1980 by Bolero Mines. The claims were current in September 1985. Glacial debris, talus, and alluvial fan material form thick gravel accumulations and flood plains, as much as 0.25 mi wide, along the creek. The present drainage channel has locally reworked surficial portions of gravel accumulations. Below the main tributary, Vienna Creek, glacial debris and alluvial fan material have been moderately sorted, and distinct terraces have formed. Depth to bedrock is estimated to be over 50 ft along most of Johnson Creek.	No workings were found.	Nine samples from three trenches were taken from terraces below Vienna Creek, and seven reconnaissance pan samples were collected from six other localities along Johnson Creek. Based on a $400/oz gold price, trench samples contained as much as $0.19/yd^3 gold; however, most had less than $0.01/yd^3. Most reconnaissance samples had less than $0.06/yd^3. One sample of a 2-ft-thick, well-sorted portion of the floodplain near the mouth of Johnson Creek contained $0.35/yd^3 gold. Samples on bedrock, where higher gold values could be expected, were not obtained due to depth of overburden. However, even the highest sample values are substantially below the minimum mine cost range of $4 to $10/yd^3.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
10	Old Ironsides claim (current claim)	The Old Ironsides claim was located in 1924; the four surrounding Iron Hat claims were recorded by Neil T. Platts in 1981. Only the Old Ironsides was current in 1985. Short segments of shear zones with various attitudes cut fractured quartz monzonite. Two northwest-trending, steeply dipping shear zones on the east side of lower Steep Creek were explored by three pits and an adit. These 1.5- to 4-ft-thick zones are composed of silicified, iron-oxide-stained country rock, and quartz stringers and pods. Most quartz has comb structure with minor amounts of pyrite and lesser amounts of fine-grained galena and pyrargyrite. Iron-oxide-stained, quartz-filled shear zones occur about 1,200 ft northeast and 1,500 ft west of the main zone. These 1- to 10-ft-thick zones trend northeast and northwest and may be faulted segments of the explored zones.	Two closely spaced, shallow prospect pits, less than 8 ft in diameter, expose the main northwest-trending shear zone. A 25-ft-long adit driven easterly, from a point about 30 ft below these pits, did not intersect the zone. Sixty feet south of the adit, another pit (8 ft by 6 ft and 3 ft deep) is on a subparallel shear zone. A small sloughed pit, 1,200 ft northeast of the adit, explored a third zone estimated to be 10 ft thick.	Six chip and two select samples were taken. A 1.5-ft-long chip sample across the principal zone contained 2.7 oz/ton silver and 0.155% lead, and one select sample of a quartz pod in the adit contained 1.1 oz/ton silver and 0.40% lead. A 3-ft-long sample across the zone south of the adit contained 0.36 oz/ton silver and 0.157% lead. Sample analyses are too low for the structures on the property to be minable by underground methods or to merit more exploration.
12	Little Bear Creek prospect	Silicified, heavily iron-oxide-stained quartz monzonite is on a trench dump. No geologic structure is exposed in the working vicinity.	One partially sloughed trench, 40 ft by 10 ft, was dug northwest into the hillside.	One select sample of the most heavily iron-oxide-stained, silicified material contained 0.07 oz/ton gold and 0.5 oz/ton silver. About 300 lb of this material is at the trench. The precious-metal content is of minable grade by open-pit mining methods, but not by underground methods. More exploration is merited.
13	Perkons Lake prospect	Small pieces of pegmatite dike and iron-oxide-stained quartz monzonite are evident in a prospect pit; however, no geologic structure is exposed in this vicinity.	One 15-ft-long, 6-ft-wide sloughed prospect pit trends northwest.	One grab sample of pegmatite material contained 0.01 oz/ton gold, but no significant amounts of other metals. This grade is too low to be minable.
15	Unnamed prospect	Dump material shows 1- to 2-in.-thick, iron-oxide-stained fractures cutting granitic rocks. These structures are probably joint-filled by quartz with streaks of arsenopyrite, sulfosalts, and pyrite; sericite is abundant on fracture surfaces.	One shallow, 4-ft by 4-ft prospect pit was found.	One select sample of mineralized material from the dump has 0.076 oz/ton gold, 5.8 oz/ton silver, 0.27% lead, and 1.75% arsenic. Precious metal content is nearly of minable grade by underground mining methods; therefore, more exploration is merited.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
16	Red Cloud prospect	Pieces of comb quartz stringers occur on prospect pit dumps and sporadically in talus. The 1- to 3-in.-thick stringers are highly iron-oxide and slightly manganese-oxide stained with some iron-oxide pseudomorphs after pyrite. These stringers probably formed along fractures, which in this vicinity trend west or northwest and dip steeply to the north in granodiorite of the Idaho Batholith.	Three sloughed prospect pits, 5 ft in diameter, are along the ridge crest about 1,000 ft apart.	Only one of four select samples of comb quartz from different localities contained detectable gold--0.02 oz/ton. Silver content ranged between 0.1 and 0.4 oz/ton. These gold and silver concentrations are too low to be minable.
17	Crown Point prospect	Short segments of northwest-trending quartz veins are in silicified granitic rocks of the Idaho Batholith; one vein is near a basalt dike. Sporadic exposures indicate vein thicknesses of 1.0 to 3.5 ft. Massive and comb quartz compose most veins; locally, narrow blue-gray quartz in stringers and small pods make up 10% of the veins. Most veins are slightly iron-oxide stained on fracture surfaces. No sulfide minerals were observed.	Seven prospect pits range from 5 ft in diameter to 15 ft by 10 ft; most pits are sloughed by never exceeded 3 ft in depth.	Four select and two chip sample of quartz vein material were taken. One select sample of vein material near the dike contained 1.5 oz/ton silver. Gold and silver content in other samples was as much as a trace and 0.3 oz/ton, respectively. These sample analyses indicate the gold and silver concentrations are too low to be minable. Additional exploration is not recommended.
18	Kansas prospect	Short segments of northwest-trending, steeply dipping fractures are filled with narrow quartz veins and stringers at the talus-covered prospect. The quartz is massive and honeycomb, and usually iron-oxide stained. On one prospect pit dump, comb quartz contains a total of 10% pyrite, arsenopyrite, galena, and pyrargyrite. County rock is medium- to coarse-grained quartz monzonite.	Two pits are on the ridge about 400 ft apart. One is 15 ft by 7 ft and 3 ft deep and the other is 3 ft in diameter and sloughed.	Four select samples of vein quartz were taken. One sample of sulfide-bearing quartz at the smaller pit contained 0.06 oz/ton gold, 7.9 oz/ton silver, 0.14% lead, and 0.05% zinc. The other three assayed as much as 0.01 oz/ton gold and 0.7 oz/ton silver. Exposed structures are too narrow and gold-silver content too randomly distributed to be minable; however, exploration in this vicinity is warranted considering the high gold and silver values.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
19	Lonely Man prospect	Three shear zones in granitic rocks are explored by two shafts. One zone strikes N. 30° W., dips 77° NE., and is 6 ft thick in the upper shaft. Footwall material is silicified quartz monzonite and quartz stringers with disseminated pyrite and galena. Along the hanging wall is a 2- to 5-in.-thick quartz vein with pyrite and galena. The lower shaft, about 1,200 ft to the southwest of upper shaft, was driven on two intersecting shear zones. The zones strike N. 40° W. and westerly, and dip northerly. Both contain quartz stringers with heavy iron-oxide stains; sulfide minerals were not observed. A 5-ft-thick zone of weathered diorite with heavily iron-oxide-stained quartz stringers is exposed in a prospect pit about 600 ft southeast of the upper shaft.	Two 6-ft-deep shafts and one pit 15 ft by 10 ft and 3 ft deep explore geologic structures. No production was recorded.	Four chip and one select sample were taken. One chip sample across the 5-in.-thick quartz vein in the upper shaft assayed 0.07 oz/ton gold and 0.7 oz/ton silver and 0.21% lead. One sample across the 6-ft-thick footwall had 1.1 oz/ton silver, 0.38% lead, and no gold. The select sample of dump material assayed 0.05 oz/ton gold and 0.4 oz/ton silver. Samples of other prospected structures contained no significant concentrations of gold or silver. The structures are too narrow and metal content is too low to indicate minable material is at the prospect. No further exploration is merited.
20	Bret Hart prospect	A 20-ft-long segment of a quartz vein in quartz monzonite is exposed in a 70-ft trench. The 1-ft-thick vein strikes east and dips 45° N. Disseminated pyrite, arsenopyrite, galena, sphalerite, and pyrargyrite are in the vein; crystals of galena and sphalerite are locally 0.25 in. across. About 300 ft northwest of the trench, a caved adit dump contains two types of vein quartz. One type is vuggy with heavy iron- and manganese-oxide stain and the other is massive with finely disseminated pyrite.	One 70-ft-long, northwest-trending trench is up to 4 ft deep, and a shallow 12 ft by 8 ft prospect pit is 15 ft west of the trench. The caved adit, started in an easterly direction, is estimated by dump volume to have 100 ft of workings.	Three select samples and one chip sample were taken. The chip sample across the 1-ft-thick quartz vein contained 0.02 oz/ton gold, 65.5 oz/ton silver, 1.4% lead, and 0.72% zinc, and one select sample of vein material on the dump had 0.02 oz/ton gold and 27.1 oz/ton silver, 2.7% lead, and 0.22% zinc. Samples of each type of vein quartz on the caved adit dump assayed a trace gold and as much as 0.3 oz/ton silver. Samples of this vein system indicate a minable grade of silver-lead-zinc material; therefore, additional exploration is warranted.
22	Silver Shield prospect	Quartz veinlets, 2 to 4 in. thick, comprise approximately 40% of a 10- to 20-ft-thick silicified zone. The zone strikes N. 45° W., dips 30° to 50° NE., and is exposed along strike for 250 ft. It is heavily iron-oxide stained, but no sulfide minerals were observed.	No workings were found.	Five chip samples taken across parts of the zone average 0.01 oz/ton gold and 0.1 oz/ton silver. Sample analyses show the material is not of minable grade, and further exploration is not merited.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
24	Ivanhoe prospect	A parallel set of joints strike N. 65° W., dip 30° to 40° NE., and are exposed prominently on a mountain side over a width of 1,000 ft. Joints contain 1- to 6-in.-thick massive and comb quartz veins, silicified and sericitized granitic rocks, and sulfide minerals. Minor secondary fractures, which strike N. 15° W. and dip 75° SW., crosscut most joint sets. An inclined shaft explores a joint containing a 4-in.-thick quartz vein with massive gray sulfide minerals and copper carbonate coatings. Granitic rocks along the vein are highly silicified and heavily iron-oxide stained.	One 22-ft-deep shaft is inclined 16° to the east. No production was recorded.	Three chip samples and one select sample were taken. One chip sample across the 4-in.-thick quartz vein in the shaft contained 17.2 oz/ton silver, 0.49% copper, and 0.19% lead. A select sample of mineralized quartz in joints above the shaft had 0.9 oz/ton silver and 0.54% lead. All gold analyses were 0.01 oz/ton. Material sampled from joints locally contains minable grades of silver, but the lack of exposure precludes a resource estimate. Similar mineralized joints occur on the Windsor prospect (no. 25), 0.5 mi to the west. This prospect would be a good exploration target for large-tonnage, precious-metal resources.
25	Windsor prospect	Joint sets, similar to those at the Ivanhoe prospect (no. 24), cut granitic rocks at the Windsor prospect. One joint has a 5- to 6-in.-thick comb quartz vein that strikes N. 60° to 80° W. and dips 35° NE. The vein contains some pyrite, galena, chalcopyrite, pyrargyrite, iron-oxide pseudomorphs after pyrite, and copper carbonate stain. Sericitized and silicified granitic wallrock borders the vein.	One 23-ft-deep shaft is inclined 25° to the east. No production has been recorded.	Three chip samples were taken. One across the 6-in.-thick quartz vein contained 21.9 oz/ton silver, 0.90% copper, 0.27% lead, and 0.14% zinc. Two chip samples across altered wallrock (one includes a narrow portion of the vein) had 1.1 oz/ton silver and a maximum of 0.15% copper and 0.21% lead. Gold content was 0.01 oz/ton for two samples. Although silver concentrations are locally high (of minable grade), the vein is inadequately exposed to constitute a resource. Additional exploration of pervasive joint sets on this prospect may reveal large tonnages of precious-metal resources.
28	Commonwealth prospect	Segments of two silicified shear zones with sulfide minerals are in quartz monzonite of the Idaho Batholith. The 1-ft-thick upper zone strikes N. 12° W., dips 52° NE., and contains pyrite and minor ruby silver (pyrargarite). About 50 vertical feet below, the 2-ft-thick lower zone strikes east and dips 65° N. It has fine to coarse grains of pyrite, galena, sphalerite, and arsenopyrite. Both zones are covered by talus beyond the workings.	One small prospect pit was dug into the hillside on each zone.	One chip sample was taken across each zone. A 1-ft-long sample across the upper zone contained 0.08 oz/ton gold and 37.2 oz/ton silver, and a 2-ft-long sample across the lower zone contained 0.04 oz/ton gold, 0.3 oz/ton silver, 0.62% lead, and 0.96% zinc. Gold and silver concentrations in the sample of the upper zone are minable. Additional exploration is warranted on both poorly exposed zones.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
29	Last Chance prospect	Talus obscures geologic structure in the vicinity; however, pieces of quartz stringers in coarse-grained granitic rocks are on dumps of two workings. The quartz exhibits mainly comb structure with minor amounts of massive blue-gray quartz with fine-grained pyrite; iron-oxide pseudomorphs after pyrite are in both types of quartz. The quartz may occur along joints which in this area trend northwest.	A caved adit, started in a northerly direction, is estimated to have 100 ft of workings. A sloughed, 4-ft-diameter prospect pit is on the ridge 2,000 ft northwest of the adit. No production is recorded.	One select sample of comb quartz from the pit dump assayed 0.04 oz/ton gold and 2.3 oz/ton silver. One select sample of quartz from the adit dump had no significant precious-metal content. The sample analyses indicate material of less than minable grade, but additional exploration is warranted on this prospect, based on its proximity to Vienna district mines.
31	Emma Creek prospect	Quartz veins as much as 2 ft thick, quartz stringers, and narrow bands of altered granitic rock strike N. 20° to 50° W. and dip 60° NE. to vertical. These structures crosscut a less dominant set of near vertical, similarly altered zones that strike N. 70° E. to east. Both sets of structures contain sericite, chlorite, (secondary) quartz, and iron-oxide stains. Pyrite, iron-oxide pseudomorphs after pyrite, and fine-grained molybdenite are in vein quartz and both sets of altered granitic rock zones.	One 8 ft by 10 ft prospect pit is dug near zone intersections.	Three chip samples were taken. Highest analyses are 0.004 oz/ton gold, 0.09 oz/ton silver, and 0.09% molybdenum. Metal content is below minable grade; additional exploration in this vicinity is not merited.
32	Crystal Clear placer claim (current claim)	In 1979, T. Eskridge claimed approximately 2 mi of the Emma Creek drainage and in 1982 turned ownership of the claim over to Bolero Mines. The claim was current in 1985. Alluvium in the drainage includes mostly poorly sorted, cobble- to boulder-size granitic rocks, and minor amounts of sand, silt, and clay.	No workings were found.	One reconnaissance placer sample of coarse to fine sand, silt, and some clay had no gold and only minor amounts of black sands. Additional exploration does not appear to be warranted.
34	Hill Side prospect	The prospect is underlain by broken blocks of Paleozoic sedimentary rocks (predominantly siltstones) and Tertiary granitic rocks. One mineralized siltstone zone, approximately 2 ft thick and exposed for 300 ft, strikes N. 15° to 35° W. and dips 50° or more to the southwest. This zone contains pyrite and iron-oxide pseudomorphs after pyrite.	No workings were found.	Two chip and two grab samples of altered sedimentary rocks contained no significant amounts of precious or base metals.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
36	Oh Cash prospect	The prospect is underlain by broken blocks of Paleozoic sedimentary rocks, comprised predominantly of calcareous argillite, limestone, and siltstone. The sedimentary rocks have been intruded by granitic rocks of Tertiary age. Two small, irregularly shaped contact metasomatic zones are along a limestone-granitic rock contact. Zones contain siliceous boxwork, heavy iron-oxide stain, and garnets.	No workings were found.	One sample from each metasomatic zone contained no significant amount of precious- or base-metal elements.
37	I.O.U. prospect	The prospect area is underlain by roof pendants of Paleozoic age sedimentary rocks and dacite porphyry of Tertiary age. A mineralized roof pendant composed of dark gray, hard siltstone and very fine quartzite with abundant pyrrhotite and minor pyrite is exposed in a cirque wall. The pendant, covered by talus at the lower end, is approximately 40 ft wide for over 160 ft of length and then narrows to less than 10 ft for another 100 ft. Prominent joints in the prospect vicinity strike N. 75° E. to east and dip of 50° to 55° NW.	No workings were found.	One grab sample of sulfide-bearing quartzite contained no significant amounts of precious or base metals.
39	Unnamed prospect	A moderately to heavily iron-oxide-stained outcrop over 500 ft long occurs along a contact between fine-grained quartzite and porphyritic dacite. Minor amounts of disseminated pyrite are in both rock types, and quartzite near the contact also has finely disseminated, gray sulfide minerals.	No workings were found.	One select sample of iron-oxide-stained quartzite contained 1.6 oz/ton silver, 0.64% copper, 0.56% lead, and 0.14% zinc. These elements were not in significant concentrations in a sample of altered dacite. The sample analysis of quartzite indicates the material is below minable grade, but more prospecting is merited, especially near the contact.
40	Apollo Creek prospect	Siltstone, quartzite, limestone, and dolomite are cut by a northwest-trending fault which contains a replacement zone of limonite, hematite, and jasperoid (very fine silica). This zone is as much as 10 ft thick and traceable for about 100 ft along the fault trend.	A 25 ft by 8 ft pit explored the zone.	Two chip samples across separate zone segments contained no significant precious- or base-metal concentrates.
41	Unnamed prospect	The prospect is underlain by Tertiary granodiorite and several small roof pendants of siltstone and limestone. All rocks are intensely iron-oxide stained. In a siltstone roof pendant, a one-ft-thick silicified layer has disseminated sulfide minerals.	No workings were found.	Two select samples of the siltstone pendant contained no significant concentrations of base or precious metals.

APPENDIX B.--Table of miscellaneous prospects and mineralized sites in and adjacent to the South Boise Yuba study area, Blaine and Camas Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
42	Baker Peak prospect	Numerous iron-oxide-stained, propylitically altered zones in hornblende granodorite of Tertiary age are scattered throughout an area of 90 acres. Pyrite occurs along fractures and is finely disseminated along most heavily stained zones. The zones strike N. 30° to 85° W. and dip 30° to 60° NE. Also on the prospect are two roof pendants. One is heavily iron-oxide stained with silificied argillite exposed over a 300 by 60 ft area, and the other occurs as a small outcrop of silicified siltstone with disseminated pyrite and pyrrhotite.	No workings were found.	Six chip samples taken from the heavily iron-oxide-stained and pyrite-bearing zones contained no significant concentrations of precious or base metals.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
		North Addition		
45	Balloon group	The 1971 USBM investigation revealed six claims were on quartz veins that range in thickness from 4 in. to 2.5 ft (Van Noy and others, 1986, p. 462). Country rock is granite of the Idaho Batholith.	Several pits were on the claims in 1971.	Two samples taken in 1971 contained no gold or silver; lead assayed a maximum of 0.07%.
46	Lucky Boy mine (patented)	According to Ballard (1922, p. 32), the property was located in 1881 by H. D. Jones and J. J. Gilson, and patented in 1888. In 1971, ownership was divided between Alice Esgleston, R. E. Campbell, and the Silver Spur Mining Co. (Shannon, 1971, p. 22). Ballard (1922, p. 32) reported that silver ore is in a quartz vein between granite walls. The pinching and swelling vein averages 5 ft thick, strikes east, and dips 45° N.	The vein was originally developed by three shafts (75, 100, and 200 ft deep) with drifts. Subsequently, adits were driven for 200, 300, and 500 ft, and a raise was extended to the surface from the 200-ft-long adit (Ballard, 1922, p. 32). USBM production records show the mine yielded a total of 1,135.7 oz silver, 506 lb copper, 433 lb lead, and 0.7 oz gold in 1884, 1934, 1938, and 1939. Mined ore reportedly ranged between 175 and 2,000 oz/ton silver (Ballard, 1922, p. 32).	No data are available.
47	Scotia mine (patented)	In 1922, the property consisted of one patented and two unpatented claims owned by Frank Becker and Frank May (Ballard, 1922, p. 32). In 1971, the patented Scotia claim was owned by Bessie Stanford (Shannon, 1971, p. 22). The claims covered an easterly extension of the Lucky Boy vein.	The vein was developed by 230, 250, and 300 ft adits, and a 100-ft raise extends to the surface from the longest adit (Ballard, 1922, p. 32). Token shipments of sorted silver ores worth as much as as $700/ton were made in 1881 (Burchard, 1881, p. 177). Ballard (1922, p. 32) reported the highest silver assay was 650 oz/ton.	No data are available.
48	Eureka prospect	The 1971 investigation by USBM geologists revealed that an iron-oxide-stained quartz vein strikes N. 25° E. and dips 36° NW. in granite (Van Noy and others, 1986, p. 462). The 4-ft-thick vein is exposed for 200 ft along strike.	Three pits were found in 1971.	Two samples collected in 1971 had a trace of gold and minor amounts of lead and copper.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
49	Ruby mine (patented)	A 5-ft-thick shear zone, which strikes N. 60° W. and dips north in granite, was found during a 1971 USBM investigation (unpublished data, on file at Western Field Operations Center, Spokane, WA). The zone is heavily oxidized, quartz filled, and visibly mineralized.	Ballard (1922, p. 33) reported three adits ranging between 500 and 1,000 ft in length. In 1962, a 492-ft-long adit was driven N. 78° E. but failed to intersect the vein at depth (Shannon, 1971, p. 21-22). Ballard (1922, p. 33) indicated much ore was packed from the property in the early days.	Three samples in 1971 across parts of the zone averaged trace gold and 4.6 oz/ton silver. One grab sample from an adit dump taken by the USBM in 1985 contained 0.02 oz/ton gold and 1.3 oz/ton silver. These concentrations are too low to be minable by underground methods that would be required at this zone; however, additional exploration is merited.
50	Lone Jack prospect	Ballard (1922, p. 31) stated that the prospect was originally located in 1880, worked until 1890, and, in 1922, consisted of four claims owned by John T. Garrett. Ballard indicated the claims extended lengthwise along a prominent vein striking east and dipping 45° N.	The vein was exposed by open cuts and short adits (Ballard, 1922, p. 31).	No data are available.
51	Columbia mine (patented)	In 1922, the Columbia mine consisted of one unpatented and three patented claims owned by the M. O. Duffy estate (Ballard, 1922, p. 37). Shannon (1971, p. 21) reported that the Columbia claim was owned by V. M. Daw and Herbert Duffy, and the Beaver claim, part of the Columbia group, was owned by F. M. Mizer. Veins on both claims were 1 to 4 ft thick near the surface (Strahorn, 1881, p. 60); they contained ruby silver, argentite, stephanite (silver antimony sulfide), and native silver (Burchard, 1881, p. 177). Ballard (1922, p. 37) showed a sketch of an adit, which intersected two veins, along the Columbia fault. These veins are likely the ones referred to by Strahorn.	The original adit was driven northeast to intersect the two veins (Ballard, 1922, p. 30). Ballard also reported the completion of 100 ft of a planned 600- or 700-ft adit intended to tap the veins at depth. He indicated total production until 1917 was slightly less than $50,000, predominantly silver. USBM production records show 425 tons of ore yielded 19 oz of gold and 5,437 oz of silver in 1937. Shipped ore averaged 0.04 oz/ton gold and 12.8 oz/ton silver.	No data are available.
52	Beaver-Bidwell mine (patented)	Two claims owned by Thomas Mizer were patented in 1883 (Ballard, 1922, p. 33). In 1971, the properties were owned by Eunice Leichliter, Thomas Mizer, and Nallie Vancil (Shannon, 1971, p. 21). The main vein strikes east, dips 45° N., and ranges between 1 and 4 ft thick where exposed (Ballard, 1922, p. 33). The ore was ruby silver and native silver (Burchard, 1883, p. 212).	Workings in 1922 consisted of three adits (150 ft, 250 ft long, and one caved) and a 120-ft-deep, two-compartment, inclined shaft with a 120-ft drift (Ballard, 1922, p. 33). Ballard reported considerable ore was shipped in the early days, but no records are available.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
54	Silver King mine (patented)	In 1922, the property consisted of one unpatented and five patented claims owned by Samuel Lewis (Ballard, 1922, p. 22). Viking Exploration Co. dewatered the shaft in 1961 and 1962. In 1971, R. E. Campbell owned the claims (Shannon, 1971, p. 20). Ballard (1922, p. 22) reported that the ore occurs in a large, tabular quartz vein up to 15 ft thick between granite walls. The vein strikes east-west and dips 60° N. Chief ore minerals were reported to be pyrargyrite, proustite, argentian stibnite, and "black metal" (argentite?).	A 600-ft inclined shaft with three intermediate levels and surface workings develop the vein. In 1942, development totaled 5,100 ft. Ore was processed at different times in: 1) a 34-tpd concentrator, 2) a 25-tpd flotation mill, and 3) a 40-tpd ball mill and flotation plant (Shannon, 1971, p. 20).	Two select samples of vein material taken by the USBM in 1985 near the shaft collar contained 0.03 oz/ton gold each, and 16.7 oz/ton and 17.8 oz/ton silver; spectrographic analyses showed about 9% and 10% antimony and 0.2% and 0.9% arsenic. These silver concentrations represent material which is minable by underground mining techniques.
55	Sunbeam and Pride of the West mine (patented)	These two patented claims were owned by D. H. Quirk in 1922 (Ballard, 1922, p. 31). In 1971, they were controlled by Sherman Furrey, Jr. (Shannon, 1971, p. 21). Ballard (1922, p. 31) indicated a western extension of the Silver King vein (an east-trending, steeply north-dipping structure) was explored on these claims. Ore stockpiled in 1922 was typical of the district (Ballard, 1922, p. 31), presumably pyrargyrite and proustite in vein quartz.	A 50-ft shaft and surface workings developed the vein in 1922 (Ballard, 1922, p. 31). In 1927, 300 ft of development of silver-antimony ores was undertaken (Campbell, 1927, p. 80). Three adits of unknown length were also on the property in 1985. No production records are available, but silver ore was probably shipped.	The owner in 1922 reported to Ballard (1922, p. 31) that three 50-lb samples averaged 40 oz/ton silver. One select sample of vein material taken by the USBM in 1985 assayed 0.11 oz/ton gold and 10.9 oz/ton silver. These metal concentrations represent material minable by underground techniques which would be required at the vein.
56	Pilgrim mine (patented)	Ballard (1922, p. 23) reported the property was located in 1879 and owned by the Pilgrim Mines Company in 1922. In 1985 Martin Pollock owned the Pilgrim claim which was patented in 1886. According to Ballard (1922, p. 23-30), drag ore in the main adit occurs in veins along the Pilgrim fault which strikes N. 60° W. and dips northerly. The veins occur in segments or tabular lenses up to 7 ft thick and contain quartz, silicified granite, gouge, and sericite. Pyrargyrite and lesser amounts of proustite are the main ore minerals, and sphalerite, galena, and stibnite are accessory. The main adit also intersects three smaller quartz veins that strike N. 80° E. and dip 60° NW. These veins were dragged southeast to a point where they intersect the main Pilgrim vein.	Sketch maps by Ballard (1922, p. 24, 28, and 29) show the main adit was driven northwest for 350 ft and includes two stoped areas and two 100-ft-deep winzes. A 200-ft-deep shaft intersects the main adit. A 100-ft-long adit is near the shaft. Former owners reported about $300,000 of ore were mined by 1922 (Ballard, 1922, p. 30). USBM records show production totaled 3 oz of gold, 1,133 oz of silver, and 56 lb of lead during 1939 and 1940.	Two select samples of dump material taken by the USBM in 1985 contained as much as 0.09 oz/ton gold and 49.2 oz/ton silver, 0.31% zinc, and 0.11% lead. The owners supplied Ballard with an assay mine map (circa 1922) which showed 65 samples had gold values of $1.20 to $3.70 (at a gold price of $20/troy oz) or 0.06 oz/ton to 0.19 oz/ton gold, and silver concentrations of 4.87 oz/ton to 30.32 oz/ton. The high silver and gold values represent material which is minable by underground techniques that would be required at the veins.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
57	Sawtooth City prospect	The 1971 USBM evaluation found a quartz vein which strikes N. 60° W. and dips 70° NE. in quartzite and siltite. The 2-ft-thick, fissure-filling vein is composed of quartz and minor amounts of gouge, crushed wallrock, and pyrite (Van Noy and others, 1986, p. 462).	One caved adit was found in 1971.	Assay of one sample taken in 1971 showed no valuable metal content.
58	Ajax prospect	A 4-ft-thick, poorly exposed alteration zone in granite was examined in 1971 by USBM geologists. The zone is iron-oxide stained and contains vuggy, pyrite-bearing quartz stringers (Van Noy and others, 1986, p. 462).	One caved adit and two pits were found in 1971.	Three samples taken in 1971 contained a trace of gold and minor amounts of lead and molybdenum.
59	Beaver Creek prospect	Iron-oxide-stained granite float was discovered during the USBM investigation in 1971 (Van Noy and others, 1986, p. 462).	A sloughed dozer trench and pit were found in 1971.	One grab sample in 1971 contained a trace of gold.
60	P & D prospect	In 1971, USBM geologists found a 3-ft-thick quartz vein in argillaceous quartzite near a contact with quartz monzonite. The vein strikes N. 55° E., dips 45° NW., and is composed of iron-oxide-stained quartz and pyrite (Van Noy and others, 1986, p. 462).	Two dozer trenches and one pit were on the prospect in 1971.	Four chip samples and one select sample were collected in 1971. Chip samples had as much as 0.48 oz/ton gold, 4.8 oz/ton silver, and 4.0% antimony. The select sample contained 3.0% lead and 0.06% copper. These metal concentrations represent a grade of material that could be mined by underground methods.
61	Ura claim group	In 1971 the claim group consisted of 12 claims that were located about 1955 (Van Noy and others, 1986, p. 455-457). USBM geologists reported two tactite zones occur near limestone-granitic rock contacts. The zones are 250 ft long, 5 to 20 ft wide, and about 2,600 ft apart. They are composed of red garnet, epidote, wollastonite, quartz, and fine-grained scheelite.	Workings in 1971 were a few shallow pits.	Thirteen samples taken from the two tactite zones in 1971 contained as much as 1.16% WO_3 (tungsten trioxide). Weighted average grade of the samples was 0.16% WO_3. The average grade is too low grade to constitute resources minable by open-pit methods. However, the high WO_3 content in samples indicates that more exploration is warranted.
62	Stibnite prospect	A 3-ft-thick vein which strikes N. 10° E. and dips 40° NW. in quartzite and siltite was examined in 1971 by USBM geologists (Van Noy and others, 1986, p. 462). The vein contained specks of pyrite and random blades of stibnite, an antimony mineral.	In 1971, prospect workings consisted of a dozen trenches and one pit.	Three samples collected in 1971 contained 0.02% to 0.09% zinc, 0.01% to 0.5% antimony, and as much as 0.07% mercury. These metal concentrations are too low to represent material minable by required underground methods.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
63	Webfoot (Mountain King) mine (patented)	The deposit was discovered in 1881 (Burchard, 1882, p. 187). The mine is on the Webfoot claim, one of 32 patented claims controlled by Lewis Hippach in 1971 (Shannon, 1971, p. 17). The First National Bank of Boston owned these claims in 1985. The main Webfoot vein strikes N. 70° to 75° W., dips 50° to 80° NE., and contains tetrahedrite, proustite, argentian galena, and sphalerite (Ross, 1927, p. 16; Umpleby, 1915, p. 231 and 248). Vein exposures in stopes indicated the main vein was about 700 ft long, ranged in thickness from a few inches to 15 ft, and averaged about 4 ft (Umpleby, 1915, p. 248).	According to Umpleby (1915, p. 248), four adits had a total of about 6,000 ft of workings. Output prior to 1917 was several million ounces of silver (Bell, 1917, p. 56). In 1934, 2,600 tons of ore was treated in a 75-tpd flotation plant (Simons, 1934, p. 93). The dumps were worked by screening and flotation milling methods during World War II (Shannon, 1971, p. 18). In 1984, drilling and sampling was done by Cash Industries. Webfoot mine production is combined with the Vienna group of mines (Vienna, Webfoot, Solace) in USBM production records. This group has produced 5,044 tons of ore, yielding 927 oz of gold, 84,962 oz of silver, 96,448 lb of lead, and 1,967 lb of zinc.	Three chip samples of portions of the vein were collected during the USBM investigation in 1984. One sample with visible ruby silver assayed 0.08 oz/ton gold and 26.3 oz/ton silver. The other two samples assayed 0.10 oz/ton gold and 4.0 oz/ton silver, and 0.30 oz/ton gold and 2.5 oz/ton silver. The gold-silver content in samples represents material that could be mined by required underground techniques.
64	Vienna mine (patented)	The mine was discovered in 1881 and was one of the best developed mines in the district that bears its name (Burchard, 1881, p. 218). In 1971, it was part of a group of patented claims owned by Lewis Hippach (Shannon, 1971, p. 19). In 1985, the mine was controlled by the First National Bank of Boston. Shannon (1971, p. 18) reported the upper part of the vein was 2 to 7 ft thick and contained limited ore worth $1/lb. Judging from dump material, which was briefly examined by the USBM in 1985, the geologic setting and vein material are similar to the nearby Webfoot and Solace mines.	The USGS Frenchman Peak 7.5-minute topographic quadrangle map shows five adits in the mine vicinity. Dump sizes indicate over 5,000 ft of workings. Burchard (1881, p. 218) noted monthly output valued at $25,000. In 1881, the mine operated all year and yielded bullion valued at $200,000 (Burchard, 1881, p. 263). USBM records combine other mine production into the Vienna group (Webfoot, Vienna, and Solace mines) from 1915 to 1977. These records show total production of 5,044 tons of ore yielded 927 oz of gold, 84,962 oz of silver, 96,448 lb of lead, and 1,967 lb of zinc.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
65	Solace mine (patented)	The property was discovered in 1881 (Strahorn, 1881, p. 60). In 1971, it was part of the Vienna group of patented claims owned by Lewis Hippach. The vein strikes generally east-west and dips 20° to 55° N. (Shannon, 1971, p. 19). Near the surface, the vein was 4 ft thick and contained argentite and tetrahedrite (Strahorn, 1881, p. 60). In the lower workings, the vein is 2 to 6 in. thick and contains proustite and sphalerite (Ross, 1927, p. 12 and 17).	Workings included an adit, an inclined winze, and four lower levels (Ross, 1927, p. 13). All workings are inaccessible. Solace mine production is combined with the Vienna group of mines (Vienna, Webfoot, Solace) in USBM production records. Total group production is 927 oz of gold, 84,962 oz of silver, 96,448 lb of lead, and 1,967 lb of zinc from 5,044 tons of ore.	No data are available.
67	Goodhope prospect	In 1971, USBM geologists found a 2-ft-thick quartz vein which strikes N. 80° W. and dips 45° NE. in granite (Van Noy and others, 1986, p. 463). Locally the vein contains pyrite, sphalerite, and galena.	Two dozer trenches were on the prospect in 1971.	Six samples taken in 1971 had a trace to 0.03 oz/ton gold, and as much as 0.56% lead and 0.79% zinc. These metal concentrations represent a grade of material too low to be minable by underground methods that would be required at the vein.
68	E & D mine	During the 1971 USBM examination, iron-oxide-stained shear zones and quartz veins, as much as 6 ft thick and containing some pyrite, were found (Van Noy and others, 1986, p. 463). Country rock is quartz monzonite of the Idaho Batholith.	Five dozer trenches were on the prospect in 1971. In 1956, 4 tons of ore were shipped that averaged 0.08 oz/ton gold, 1.9 oz/ton silver, and 3.5% lead (unpublished data on file at Western Field Operations Center, Spokane, WA).	Ten chip samples taken during the 1971 investigation averaged 0.085 oz/ton gold, 0.46 oz/ton silver, and 0.76% lead. These metal concentrations are too low to constitute resources minable by the underground mining methods that would be required at this property.
69	Rabbit Foot prospect	In 1971, USBM geologists examined an iron-oxide-stained shear zone which strikes N. 65° E. and dips 63° NW. in quartz monzonite (Van Noy and others, 1986, p. 463). The 20-in.-thick zone is filled with quartz, gouge, and brecciated country rock.	In 1971 there were two trenches on the prospect.	Three samples taken in 1971 contained a trace gold and a maximum of 0.1 oz/ton silver and 0.6% lead. These metal concentrations are too low to be minable by required underground techniques.
70	Frenchie prospect	In 1971, a silicified, iron-oxide-stained zone which occurs in granite was examined by USBM geologists (Van Noy and others, 1986, p. 463). No sulfide minerals were observed.	No workings were found in 1971.	One sample taken in 1971 contained 0.2 oz/ton silver and 0.6% lead. This grade is too low to mine.
71	Salmon River prospect	USBM geologists in 1971 found a fault zone that strikes N. 70° E. and dips 45° SE. in quartzite (Van Noy and others, 1986, p. 463). No sulfide minerals were observed.	A 100-ft-long adit driven S. 40° W. failed to intersect the northeast-trending fault zone.	No valuable metals were detected in two samples collected in 1971.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
		Southwest Addition		
72	Tahoma mine (patented)	Anderson (1939, p. 20, 64, 65) reported that the Tahoma is one of the oldest mines in the Yuba mining district. The Tahoma lode, at least 4,000 ft in length and averaging 35 ft thick, is one of the largest of the west-northwest-trending lodes. It has been severely disturbed by tectonic adjustments resulting in a non-uniform orientation; the strike is generally N. 50 W. with a steep northeast dip.	Prospecting has occurred for a distance of not less than 4,000 ft along the lode. Mining was intermittent, but the richest ore was mined by the mid-1880's (Anderson, 1939, p. 64). In 1881, 300 tons of ore was reported to have yielded $100 to $300/ton (Anderson, 1939, p. 65). The mine operated in 1906 and 1907, and two adits were started in 1933.	No data are available.
73	Greenback mine	Anderson (1939, p. 69) reported the mine is on a fracture zone, as much as 16 ft across, that trends west-northwest and is traceable for about 2,000 ft mainly in old workings. Thin veins and small lenses of quartz are throughout the fractured granitic rock.	In 1936 one of two closely spaced adits was being worked (Anderson, 1939, p. 69). The upper adit was about 50 ft long and the lower adit, 50 vertical ft below, was about 70 ft long. It was reported to Anderson (1939, p. 69) that small pockets of rich ore were mined along different parts of the fracture zone.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
74	Atlanta lode mines (historic), (patented)	Anderson (1939, p. 1, 2, 19-45) reported that the Atlanta lode, a mineralized structure discovered in 1864, has yielded mainly gold and silver under many mine names and owners. The most productive mines were the Boise-Rochester, Monarch, Buffalo, Pettit, Old Chuck, Bagdad-Chase, and Jessie Benton. From 1932 to 1936, St. Joe Minerals mined along the east end of the lode. In 1938 all mines along the lode were consolidated into the Talache mine. Since 1984, the Atlanta Gold Mines Corporation has been exploring a low-grade gold deposit on the lode. The Atlanta lode cuts granitic rocks of the Idaho Batholith, strikes N. 50° to 70° E., and dips steeply northwest and southeast. It is traceable along strike for more than 2 mi and is 40 to 120 ft thick. Six main ore shoots along the lode are 200 to 800 ft long, 400 to 800 ft high, and 4 to 6 ft thick (locally as much as 30 ft). Shoots contain free gold in comb and drusy quartz, complex silver sulphosalts, base-metal sulfide minerals, pyrite, and arsenopyrite. Scheelite in calcite and quartz was noted in the early 1940's (Skidmore, 1941, p. 75).	At least 30,000 ft of workings, including crosscuts, drifts, shafts, and stopes, are estimated on the lode (Anderson, 1939, p. 1-70; USBM file maps). Mills were constructed at all major mines; however, none were operational in 1985. Incomplete records indicate mines along the Atlanta lode have produced about $7 million worth of minerals--mainly gold and lesser amounts of silver and base-metals. Peak productive years were 1875 to 1885, and 1931 to 1938. Anderson (1939, p. 1) reported mill heads averaged slightly less than 0.5 oz/ton gold and 1 to 2 oz/ton silver. Individual mine production, in millions of dollars, is: Boise-Rochester (+2.5), Monarch (+2), Buffalo (+1.2), and Talache (+1). In 1942 and 1943 a total of 1,432.4 units (28,648 lb) of WO_3 (tungsten trioxide) were produced from 15,849 tons of ore (unpublished data on file at Western Field Operations Center, Spokane, WA).	The bonanza ores of this epithermal deposit have probably been mined. Recent drilling, 1984 and 1985, by the Atlanta Gold Corporation along the Atlanta lode has delineated a low-grade gold deposit. A USBM unpublished report (available at Western Field Operations Center, Spokane, WA). estimated 1,928 units (38,560 lb) of WO_3 were contained in about 21,330 tons of ore.
75	Atlanta Gold Mines prospect (partly patented)	The Atlanta Gold Corporation, pending permits and approval, plans to begin construction of facilities to open-pit mine on the Atlanta lode in 1987 (unpublished company plan of operations report, 1986). Extensive sampling, drilling, trenching, and metallurgical testing from 1984 to 1986 has defined a disseminated, low-grade, gold-silver deposit.	The mine is scheduled to include two open pits, cyanide-heap leach pads, a precious metal recovery plant and support facilities, about 150 patented and unpatented claims, several millsites, and some lands managed by the USFS.	The company estimates that 6.92 million tons of ore, averaging 0.067 oz/ton gold plus a silver credit, is in two zones to a depth of 200 ft. One zone is 43 ft to 226 ft wide, 1,400 ft long, and contains 2.7 million tons averaging 0.041 oz/ton gold. The second zone is 65 to 110 ft wide, 2,400 ft long, and has 3.92 million tons averaging 0.086 oz/ton gold.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
76	Minerva mine (patented)	This is one of the oldest gold mines in the Yuba district, and in 1928 it consisted of 10 patented and 3 unpatented claims (Ballard, 1928, p. 35). Mining activity was intermittent from the mid-1860's through 1919. One of the four parallel lodes oblique to the Atlanta lode, it is traceable for 2,000 to 4,000 ft along trend. The N. 65° W. striking lode averages from 8 to 10 ft thick and dips about 45° NE. (Ballard, 1928, p. 17 and 35; Anderson, 1939, p. 20). The ore is similar to the Atlanta lode--free-milling gold and ruby silver.	USBM records show from 1905 to 1942 the mine produced about 17,400 oz of gold and 43,900 oz of silver from nearly 68,000 tons of ore. About 70% was produced between 1909 and 1911.	No data are available.
85	Spanish Town mine	In 1928 there were seven unpatented claims marking the northeast end of the Rocky Bar mineralized zone. Work was done in 1937 and 1938 by Elk Creek Spanish Town Mines, Inc., mostly placering of the slope wash. The mineralized zone consists of quartz-filled fractures which trend N. 70° E., dip 30° to 35° NW., and incorporate at least one quartz vein (Anderson, 1943, p. 34-35).	Two adits, 500 and 390 ft in length with lesser workings, are reported. The ore assayed 2 to 3 oz/ton gold (Anderson, 1943, p. 35).	No data are available.
87	Lison mine (patented)	Anderson (1943, p. 13-15, 33) and Ballard (1928, p. 28) reported that the Pfeiffer brothers located the General Grant, General Sherman, and the Poorman claims in 1873. Later, these claims, along with the Republic, Homestake, and Goldbug, were consolidated as the Lison mine, comprising 5 patented and 7 unpatented claims. Considerable work was done in 1918-1919 by Treasure Mines, Inc. The mine was worked in 1923 by the Rocky Bar Mining Company and in 1934-1935 by Canada Gold Mines, Inc. The lode strikes N. 80° to 85° W. and dips 55° to 60° NE. Where exposed, it is 2 to 3 ft wide with stringers of quartz 2 to 3 in. thick accompanied, in part, by scattered small lenses of quartz.	The General Grant and Goldbug claims have been developed extensively, including two short adits and a long crosscut. No records of early operations or production are available. Ballard (1928, p. 15) simply stated that there was considerable gold production, both lode and placer.	Ballard (1928, p. 15) panned mill concentrates which assayed 1.54 oz/ton gold and 1.2 oz/ton silver.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
88	Ophir mine (patented)	Anderson (1943, p. 32-32) reoprted that this is one of the oldest mines in the vicinity of Bear Creek. A 2- to 6-ft-thick vein, locally much thicker, strikes N. 80° W., and dips 50° to 55° NE., and can be traced on the surface for several thousand feet.	Known development consists of a 285-ft-deep shaft and two adits, one about 400 ft long with a 90-ft winze, crosscuts, and a 90-ft incline. Production was valued at about $80,000 prior to 1880, and yield from 1881 to 1928 was reported to be $2,250,000 (Anderson, 1943, p. 32).	No data are available.
89	Howard prospect (patented)	Anderson (1943, p. 36) reported that this 3-ft-wide lode strikes N. 80° E., dips 65° to 70° SE., and hosts stringers of quartz along fractures.	By 1943, development comprised three short adits and at least 385 ft of workings with stopes (Anderson, 1943, p. 36).	No data are available.
90	Bonaparte mine (patented)	Anderson (1943, 13-15, 36) reported that work occurred at the property as early as 1868. By 1870, under the management of the New York and Ohio Company in partnership with the Bonaparte Company, it was the most active mine in the Rocky Bar area. Operations were suspended in 1873. Minor work was done in 1910. The lode reportedly strikes N. 85° W. and dips steeply north.	Apparently the mine was developed by adits, none of which gained much depth below the surface. Production from 1868 to 1883 was reported to be about $500,000 (Anderson, 1943, p. 36).	No data are available.
94	Red Horse mine	The mine is in granitic rocks of the Idaho Batholith (Rember and Bennet, 1979, map). Information on the mineralized structure at the mine is not available, but structures are probably shear zone(s) similar to the nearby Tip Top mine (plate 1). Exploration and development was conducted in 1985 by the Platts family (R. Platts, oral commun., 1985).	A southwest-trending adit, two prospect pits, and a building are shown on the USGS Ross Peak 7.5-minute quadrangle map (1964). USBM production records indicate that between 1921 and 1940 the mine yielded a total of 1,126.81 oz of gold, 544 oz of silver, and 15 lb of zinc from 265.68 tons of ore.	Mined ore averaged 4.24 oz/ton gold and 2.05 oz/ton silver (USBM production records). No resource data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
95	El Oro mine	The mine is in granitic rocks of the Idaho Batholith (Rember and Bennett, 1979, map). No information is published on the mineralized structures; however, shear zones similar to the Tip Top mine (plate 1) may underlie the El Oro.	Two southeast-trending adits are depicted on the USGS Newman Peak 7.5-minute quadrangle map (1964). USBM records show that from 1910 to 1941 the mine yielded approximately 9,800 tons of ore containing 3,900 oz of gold, 2,100 oz of silver, 4,800 lb of lead, and 140 lb of copper.	Mined ore averaged 0.40 oz/ton gold, 0.21 oz/ton silver, and minor amounts of lead and zinc. No resource data are available.
96	Old Sam mine	The mine is on a group of five claims which were patented by various claimants between 1886 and 1915. These claims were held by R. S. Mockett in 1985. The property is in granitic rocks of the Idaho Batholith (Rember and Bennett, 1979, map); however, no information is available on the mineralized structures.	A southwest-trending adit, a prospect pit, and building ruins are depicted on the USGS Newman Peak 7.5-minute quadrangle map (1964). No production data are available.	No data are available.
97	Axoloti mine	The property was visited briefly by the authors in 1985. An accumulation of alluvial material composed of poorly to moderately sorted granitic rocks lies about 150 ft above the South Fork of the South Boise River. The Axoloti placer claim was located by T. N. Platts in 1903 and his family has kept it current through 1985.	USBM production records indicate that 18.56 oz of gold and 3 oz of silver were sluiced and hydraulicked from at least 4,000 yd^3 of material. Production occurred during parts of six years between 1934 and 1942.	At a gold value of $400/oz, the unit value averaged a maximum of $1.77/$yd^3$. No other data are available.
		Southeast Addition		
102	Tyrannis mine (patented)	Umpleby (1915, p. 239) reported that this mine was covered by five patented claims. The vein, where exposed, was 18 in. to 8 ft (average 3 ft) wide with a strike of N. 60° E. and a dip of 37° NW.	Four adits aggregated about 4,000 ft of workings. Unverified local reports indicate the mine yielded metal valued at $100,000 (Umpleby, 1915, p. 239). The ore grade was reported to be 100 oz/ton silver.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
103	Stormy Galore mine	Umpleby (1915, p. 239) reported intermittent operation of the property since its discovery in 1882. There were three unpatented claims in 1915. The vein generally strikes N. 7° E., dips 60° SE., and averages 3 ft thick. The ore was said to contain about 400 oz/ton silver, the highest reported grade in the Little Smoky mining district.	Production from four adits, with about 2,000 ft of workings, is reported to have been valued at $100,000 prior to 1915 (Umpleby, 1915, p. 239). USBM records show that in 1913, 1943, and 1944, production totaled 5.03 oz of gold, 2,605 oz of silver, 6,335 lb of lead, 2,153 lb of zinc, and 463 lb of copper.	No data are available.
104	Silver Crown (Climax) mine	The deposit is on a northwest-trending, northerly dipping fault contact between granite and argillite (unpublished data on file at Western Field Operations Center, Spokane, WA). A shear zone in the fault contains small lenses of mineralized quartz. Umpleby (1915, p. 238) reported the ore consisted of tetrahedrite, galena, and sphalerite scattered in coarse, quartz-siderite gangue.	By 1943, exploration and development work consisted of three adits - 200, 300, and 500 ft in length - a shaft (caved then), and three prospect pits (unpublished data on file at Western Field Operations Center, Spokane, WA). In the early years, the ore produced is said to have been worth $30,000 (Umpleby, 1915, p. 238). USBM records show production in 1921 was 0.09 oz gold, 459 oz of silver, and 630 lb of lead.	Two samples taken across quartz lenses 1.4 and 2.8 ft thick at underground localities in 1943 by USBM engineers contained a maximum of 0.03 oz/ton gold, 0.05 oz/ton silver, 0.3% zinc, and 0.2% lead. These metal concentrations are too low to constitute resources minable by underground methods that would be required at this property.
105	Hornsilver (Sunday) mine	Argentiferous galena ores were on two unpatented claims, according to Umpleby (1915, p. 239), and dump material suggested that the ore consisted of galena, pyrite, and chalcopyrite in a gangue of quartz and minor siderite mixed with calcareous shale.	Production value of between $15,000 and $20,000 was reported by Umpleby (1915, p. 234). USBM records show total production between 1921 and 1948 was 22 oz of gold, 7,185 oz of silver, 15,497 oz of lead, 1,968 lb of zinc, and 1,176 lb of copper.	No data are available.
106	King of West mine (patented)	Umpleby (1915, p. 238-239) reported that this mine, on three patented claims and a mill site, was worked for 12 years following discovery in 1881. The vein trends northeast and dips steeply northwest.	None of the estimated 3,000 ft of workings, including a 400-ft shaft and principal adit, were accessible in 1915 (Umpleby, 1915, p. 238). By 1915 the production yielded $200,000 (Umpleby, 1915, p. 234). USBM records show the mine had intermittent production from 1919 to 1973 that totaled 95 oz of gold, 35,277 oz of silver, 118,548 lb of lead, 33,478 lb of zinc, and 4,628 lb of copper. The ore is said to have had a grade of 120 oz/ton silver.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
107	Silver Star mine (patented)	Umpleby (1915, p. 237-238) reported that this mine, on 10 to 12 patented claims, had been idle since 1888. The "ledge" trends east and dips 40° to 45° S. at one outcrop in siliceous limestone. Dip steepens to nearly vertical with depth. The "ore" on one dump consisted of tetrahedrite, sphalerite, galena, pyrite, and chalcopyrite in quartz-siderite gangue.	At least 2,500 ft of drifts emmanate from a 270-ft decline. A crosscut adit and winze extend the workings about an additional 400 ft. By 1888, production was valued at $75,000, and 15,000 tons of ore remained on dumps (Umpleby, 1915, p. 238). USBM records show production between 1937 and 1941, and in 1969, totaled 58 oz of gold, 16,587 oz of silver, 94,501 lb of lead, 6,400 lb of zinc, and 5,442 lb of copper. The ore was said to contain 15 to 16 oz/ton silver, 4% lead, and 4% or greater zinc.	No data are available.
108	Carrie Leonard mine (patented)	Umpleby (1915, p. 236-237) reported eight patented claims were focused on the intersection of two veins striking N. 40° E. and N. 55° E. and dipping 40° SE. and 58° SE., respectively. The grade of ore is said to have averaged 30% lead, 5% to 6% zinc, and 150 oz/ton silver. The Y-shaped ore body extended southward from the vein intersection 100 ft along one vein and 70 ft along the other, and occurred vertically for 160 ft (Umpleby, 1915, p. 236).	The mine was developed by seven adits; one of which was being driven in 1914. The mine is reported to have yielded $500,000 (Umpleby, 1915, p. 236). USBM records show production between 1913-1916, and in 1939, 1940, and 1943 totaled 18 oz of gold, 12,472 oz of silver, 106,491 lb of zinc, 29,043 lb of lead, and 645 lb of copper.	No data are available.
109	Jane Lee mine	Quartzite and limestone are intruded by granitic rocks of the Idaho Batholith. Narrow quartz stringers with very short strike lengths are entirely in sedimentary rocks (unpublished data on file at Western Field Operations Center, Spokane, WA). The stringers contain small amounts of galena, sphalerite, and pyrite.	Five adits totaling about 1,200 ft (one is 650 ft long), and one small open cut, were on the prospect in 1944 (unpublished data). Less than 100 tons of ore was recovered, based on stope development. Early records are not available for probable productive years between 1880 and 1900. USBM records show that in 1939 and 1942, a total of about 200 oz of silver, 780 lb of lead, and 480 lb of zinc were produced.	Two chip samples of the best appearing outcrop in 1944 contained as much as 0.025 oz/ton gold, 3.65 oz/ton silver, 2.6% lead, and 0.5% zinc (unpublished data). Resource data are not available, but these metal concentrations represent material that is probably too low grade to be minable by selective, underground mining methods.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
110	Isabella mine (patented)	Umpleby (1915, p. 237) reported on a patented claim on this property which was discovered in 1881. Early operations were by lessees. The ore is said to have been of excellent grade. Some contained as much as 400 oz/ton silver, along with lead and some zinc.	Development consisted of three short adits and a 50-ft shaft. Production is reported to have yielded $25,000 (Umpleby, 1915, p. 237). USBM records show that production in 1884 and 1934-1936 totaled about 700 oz of silver, 19,800 lb of lead, 4,500 lb of zinc, 600 lb of copper, and 4 oz of gold.	No data are available.
111	Dollarhide mine	Umpleby (1915, p. 236-237) reported that 17 claims covered a zinc-lead-bearing, 3- to 6-ft-wide, siliceous vein striking N. 50° to 60° W. The eastern portion of the vein dips 60° SE. and, beyond a crosscutting diorite porphyry dike, the western portion of the vein dips 70° NE. The vein is of about one-half quartz with scattered sphalerite and galena, and one-half crushed limestone wallrock.	Development consisted of 3,000 ft of workings in four adits about 100 ft apart. Umpleby (1915, p. 234) indicated that the production value totaled $75,000.	No data are available.
119	Old Ontario mine (patented)	Granitic rocks have intruded sedimentary rocks (slates and calcareous sandstones). According to Umpleby (1915, p. 241), two vein systems, each offset by numerous normal faults, have been explored. Dump material had fine-grained galena, arsenopyrite, pyrite, and minor sphalerite and chalcopyrite in quartz gangue. Small patches of these minerals are in sericitized granitic rocks. Umpleby indicated replacement of granitic rocks was involved in the ore formation.	Many adits, totaling several thousands of feet in length, were driven in both rock types. In 1915, all adits were caved except one which was inaccessible beyond 500 ft. USBM production records show that between 1884 and 1902 the mine yielded over 56,000 oz of silver and 95,000 lb of lead. From 1915 to 1948, production records for the Ontario and Lucky Boy mines were combined. Total production was about 70 oz of gold, 4,800 oz of silver, 919,000 lb of zinc, 67,000 lb of lead, and 1,400 lb of copper.	No data are available.

APPENDIX C.--Table of known mines and prospects in and adjacent to the three additions to the South Boise Yuba study area, Blaine, Camas, and Elmore Counties, ID--Continued

Map no. (plate 1)	Name	Summary	Workings and production	Sample data and resource data
120	Lucky Boy mine	A replacement deposit occurs along a "marblized" limestone-granitic rock contact (unpublished data, 1944, on file at Western Field Operations Center, Spokane, WA). Ore bodies were 10 to 20 ft wide, as much as 30 ft long, and mined to a depth of 100 ft. Sulfide minerals, primarily sphalerite, pyrite, pyrrhotite, and galena, occur as masses and disseminations in limestone.	In 1944, accessible workings consisted of about 650 ft of drifts and crosscuts on one level. Stopes were caved or flooded (unpublished data). USBM production records show that from 1905 to 1912 the mine yielded about 1,350,000 lb of zinc, 6,300 lb of lead, 400 oz of silver, and 3 oz of gold. From 1915 to 1948, records were combined with the Ontario mine. Total production for both mines was 70 oz of gold, 4,800 oz of silver, 919,000 lb of zinc, 67,000 lb of lead, and 1,400 lb of copper.	A USBM engineer in 1944 (unpublished data) estimated 75 to 100 tons of inferred "ore" containing about 30% zinc was in the workings. He also estimated 50 to 100 tons of ore averaging about 20% zinc remained on the adit dump.
122	Blue Kitten mine (patented)	According to a DMEA (Defense Minerals Exploration Administration, unpublished 1955 report) and USBM production records, the mine was discovered in 1905 and was operated or explored until 1952. Paleozoic limestone has been intruded by granitic rocks and related dikes of the Idaho Batholith. Two parallel veins strike N. 25° W. and dip 55° SW. in siliceous limestone near the granitic rock contact. Veins contain galena, sphalerite, pyrite, quartz, calcite, and some crushed country rock. Ore minerals occur as fissure fillings and replacements. The veins range in thickness from less than 1 in. to 14 ft, with the larger vein averaging 6 ft thick. Encountered during the DMEA exploration were numerous veinlets; usually along limestone bedding planes.	Workings were reported to consist of three northeast-trending adits (240 ft, 350 ft, and 600 ft long plus stopes and a raise) and numerous prospect pits. About one-half of this excavation and 293 ft of diamond drilling, was done under DMEA contract. USBM production records show the mine yielded approximately 2 oz of gold, 2,600 oz of silver, 600 lb of copper, 35,000 lb of lead, and 78,000 lb of zinc between 1940 and 1952.	Three DMEA samples contained as much as 0.90 oz/ton silver, 1.90% lead, and 3.19% zinc. One sample across a 14-ft-thick vein exposure, reported to the DMEA team, contained 8% combined lead and zinc, and 3 to 4 oz/ton silver. About 32,000 tons of indicated and inferred "ore" (no grade given) was estimated during the DMEA study.

APPENDIX D.--Resource definitions, resource projections, and economic considerations

RESOURCE DEFINITIONS

Resource estimates were made when possible and classified according to the following definitions (U.S. Bureau of Mines and U.S. Geological Survey, 1980).

Resource.--A concentration of naturally occurring solid, liquid, or gaseous material in or on the Earth's crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible.

Identified resources.--Resources whose location, grade, quality, and quantity are known or estimated from specific geologic evidence. Identified resources include economic, marginally economic, and subeconomic components. To reflect varying degrees of geologic certainty, these economic divisions can be subdivided into measured, indicated, and inferred.

Reserves.--That part of the reserve base which could be economically extracted or produced at the time of determination. The term reserves need not signify that extraction facilities are in place and operative. (For this designation the word "ore" is applicable).

Measured.--Quantity is computed from dimensions revealed in outcrops, trenches, workings, or drill holes; grade and (or) quality are computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, depth, and mineral content of the resource are well established.

Indicated.--Quantity and grade and (or) quality are computed from information similar to that used for measured resources, but the sites for inspection, sampling, and measurement are farther apart or are otherwise less adequately spaced. The degree of assurance, although lower than that for measured resources, is high enough to assume continuity between points of observation.

Inferred.--Estimates are based on an assumed continuity beyond measured and (or) indicated resources, for which there is geologic evidence. Inferred resources may or may not be supported by samples or measurements.

Subeconomic resources.--The part of identified resources that does not meet the economic criteria of reserves and marginal reserves. (Capital return would be less than 80 percent of all expenditures.

Occurrence.--Materials that are too low grade or for other reasons are not considered potentially economic.

RESOURCE PROJECTIONS

For determining inferred resources in vein and shear zone deposits described in this report, the geologic structures were generally estimated to extend one-half their observed strike length, to extend at least one-half their known strike length down dip (and also up dip if the structure was in an underground working), and to maintain the same thickness and grade throughout.

ECONOMIC CONSIDERATIONS

Resource classification for individual deposits change dramatically in response to sudden fluctuations in the price of gold and silver, the study area's chief commodities. The following discussion is intended to familiarize the reader with some of the factors affecting resource values and production costs. Resource classifications for any one mineral deposit change with commmodity availability and demand - what is not minable today may be minable in the future. Production costs are dictated by conditions such as accessibility, size and depth of the deposit, amenability to metallurgical treatment, power availability, and location relative to a labor source. Market conditions and the degree of dependence of the United States on foreign sources for various commodities are also significant cost factors.

Gold and silver in steeply dipping shear zones or quartz veins are the main lode resources in the study area. Similarly occurring mineralized structures in nearby areas have been mined by underground methods. Valuable minerals were recovered by simple gravity or flotation methods with minimal metallurgical problems.

Identified resources in the study area are small; the largest is estimated to contain only 45,000 tons. Some of the deposits might be considered minable as 2- to 5-man operations, such as was being attempted at the Tip Top mine in 1985. A 1985 cost analysis by the USBM, for a prospect in this vicinity, showed recoverable metal values would have to average about $100 per ton to cover capital and operating costs, and earn a minimal rate of return (less than 5 percent). This assumes an underground mining rate of 12 tpd from a 2-ft-thick, gold-bearing quartz vein for 180 days a year, and on-site milling by gravity recovery (jigging or tabling). Using the custom flotation mill at Warm Spring Creek, which is 20 to 40 mi from most of the study area deposits, would require recoverable metal values of about $150 per ton for a minimal return. Open-pit mining and heap leaching at small (50 to 100 tpd), near-surface mineralized zones, such as may be planned for the Raymond and Aurora claim groups, could be done for about $60 per ton (Benjamin and Gale, 1984). This cost is reduced dramatically as the resource size, and corresponding mining and milling rates, increase.

Placer gold in near-surface deposits of 100,000 to 1,000,000 yd^3 can be mined for about $10/$yd^3$. Larger deposits consisting of sorted placer material could be mined for less than $4/$yd^3$. However, study area placer deposits would require more than $10/$yd^3$ because they are of poorly sorted, glaciofluvial origin with a large percentage of boulders and randomly occurring, fine gold particles.

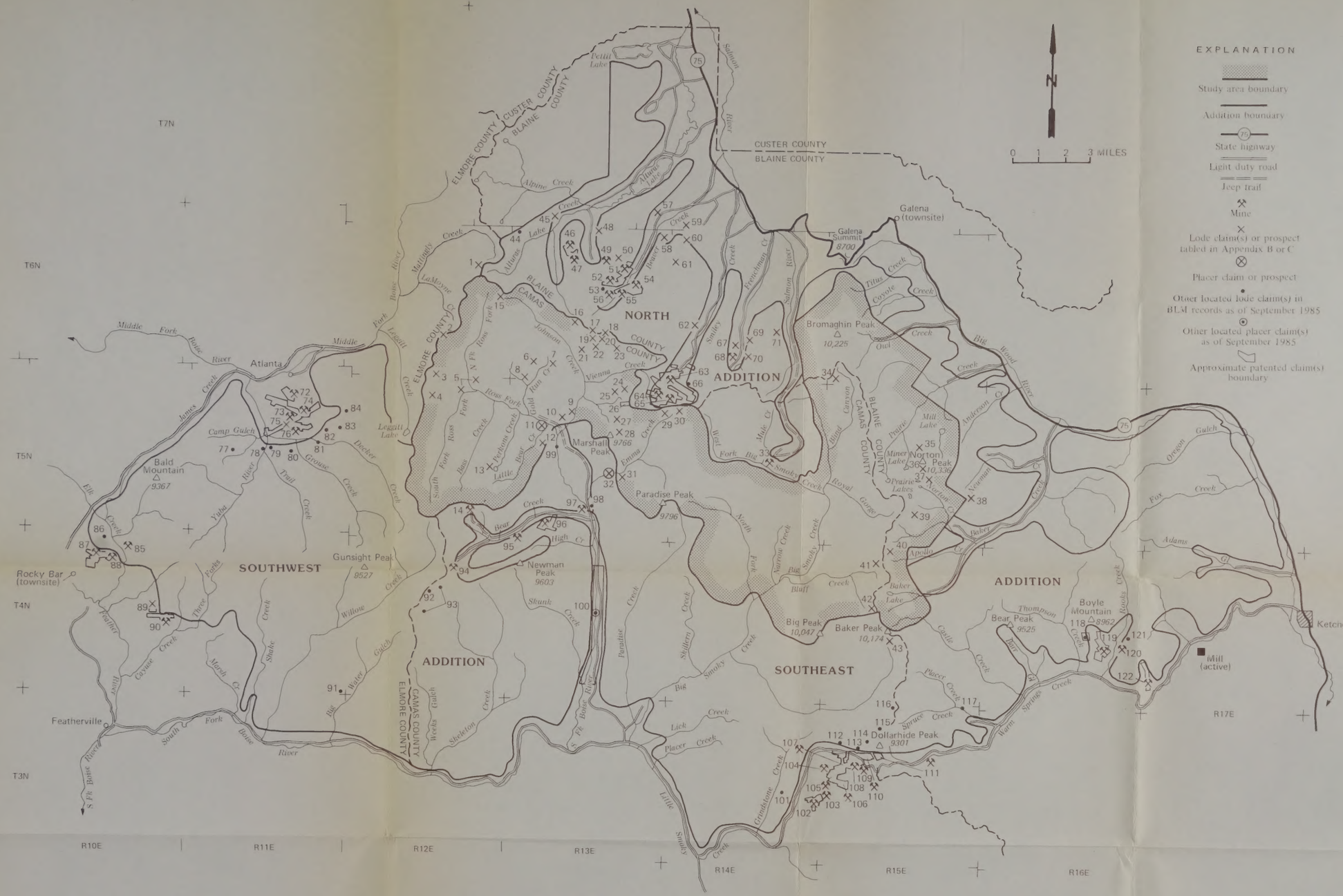


PLATE 1.-- Mines, prospects, claims, and mineralized sites in and adjacent to the South Boise Yuba study area and additions

Mines, prospects, and claims

Study area

1. This Is It claims
2. Pilot Knob prospect
3. Cliff prospect
4. Cumberland prospect
5. Lee prospect
6. Rex prospect
7. Ibex prospect
8. Gold Run Creek prospect
9. John L placer claims
10. Old Ironsides claim
11. Ross nos. 1-10 placer claims
12. Little Bear Creek prospect
13. Perkins Lake prospect
14. Tip Top mine
15. Unnamed prospect
16. Red Cloud prospect
17. Crown Point prospect
18. Kansas prospect
19. Lonely Man prospect
20. Bret Hart prospect
21. Baltic prospect
22. Silver Shield prospect
23. Golden Dawn prospect
24. Ivanhoe prospect
25. Windsor prospect
26. Diamond Prince claim (patented)
27. Silver Leaf nos. 1-3 claims
28. Commonwealth prospect
29. Last Chance prospect
30. Raymond and Aurora claim groups
31. Emma Creek prospect
32. Crystal Clear placer claim
33. Mountain King mine
34. Hill Side prospect
35. Susan prospect
36. Oh Cash prospect
37. I.O.U. prospect
38. Newman Creek prospect
39. Unnamed prospect
40. Apollo Creek prospect
41. Unnamed prospect
42. Baker Peak prospect
43. Horseshoe prospect

North Addition

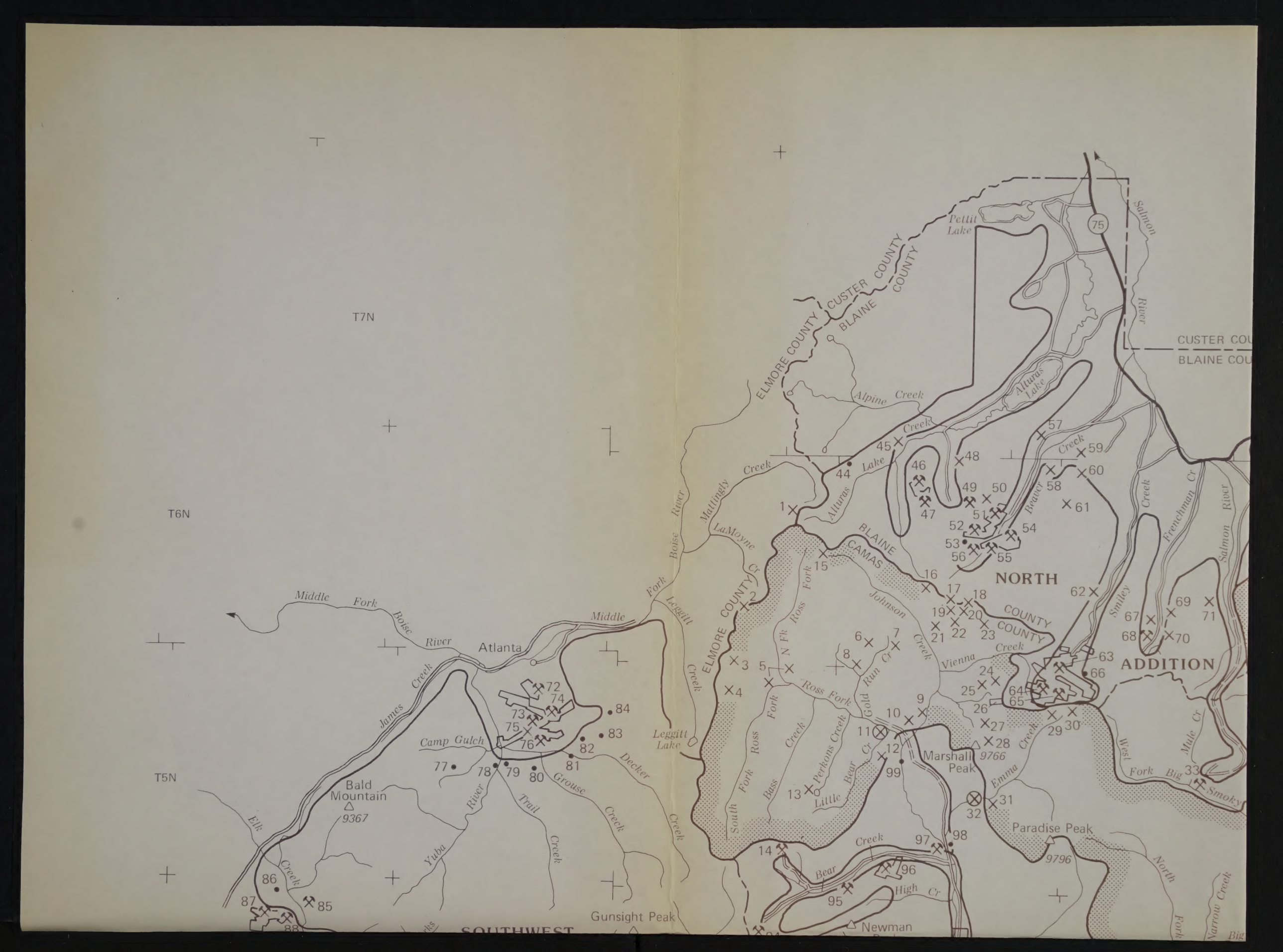
44. Star Mountain Silver claim group
45. Balloon group
46. Lucky Boy mine
47. Scotia mine
48. Eureka prospect
49. Ruby mine
50. Lone Jack prospect
51. Columbia mine
52. Beaver-Bidwell mine
53. Beaver Creek claim group
54. Silver King mine
55. Sunbeam and Pride of the West mine
56. Pilgrim mine
57. Sawtooth City prospect
58. Ajax prospect
59. Beaver Creek prospect
60. P & D prospect
61. Ura claim group
62. Stibnite prospect
63. Webfoot (Mountain King) mine
64. Vienna mine
65. Solace mine
66. Chandler Western Reserve claim group
67. Goodhope prospect
68. E & D mine
69. Rabbit Foot prospect
70. Frenchie prospect
71. Salmon River prospect

Southwest Addition

72. Tahoma mine
73. Greenback mine
74. Atlanta lode mines (historic)
75. Atlanta Gold Mines prospect
76. Minerva mine
77. Camp Creek claim group
78. Golden Stinger claim
79. Pardner claim
80. Grouse Creek claim group
81. Decker claim group
82. Flint claim group
83. Polar Bear claim group
84. Good Chance claim group
85. Spanish Town mine
86. Golden Sunrise claim group
87. Lison mine
88. Ophir mine
89. Howard prospect
90. Bonaparte mine
91. Gold Ridge claim group
92. Spook claim group
93. Gold Mountain claim group
94. Red Horse mine
95. El Oro mine
96. Old Sam mine
97. Axolotl mine
98. Bear Creek placer claim group
99. Hazel B. placer claim
100. Portland Placer claim group (patented)

Southeast Addition

101. Triple J. claim group
102. Tyrannis mine
103. Stormy Galore mine
104. Silver Crown (Climax) mine
105. Hornsilver (Sunday) mine
106. King of the West mine
107. Silver Star mine
108. Carrie Leonard mine
109. Jane Lee mine
110. Isabella mine
111. Dollarhide mine
112. Carrietown claim group
113. Virgin claim group
114. Lizard claim group
115. Chandler Western Reserve claim group
116. Little Smoky claim group
117. Scrubo, Tuffet, and Muffet placer claim
118. U and I claim group
119. Old Ontario mine
120. Lucky Boy mine
121. Pay claim group
122. Blue Kitten mine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Creek
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Atlanta
James Creek
Camp Gulch
Leggitt Creek
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Bald Mountain
9367
Elk Creek
Yuba River
Trail Creek
Grouse Creek
Decker Creek
Gunsight Peak
SOUTHWEST
BLAINE
CAMAS
NORTH
COUNTY
ADDITION
Johnson Creek
Vienna Creek
N Fk Ross Fork
Ross Fork
South Fork Ross Fork
Bass Creek
Perkons Creek
Little Bear Cr
Gold Run Cr
Marshall Peak
9766
Emma Creek
Paradise Peak
9796
Bear Creek
High Cr
Newman
Beaver Creek
Smiley Creek
Frenchman Cr
Salmon River
West Fork Big Smoky
Mule Cr
North Fork Narrow Creek
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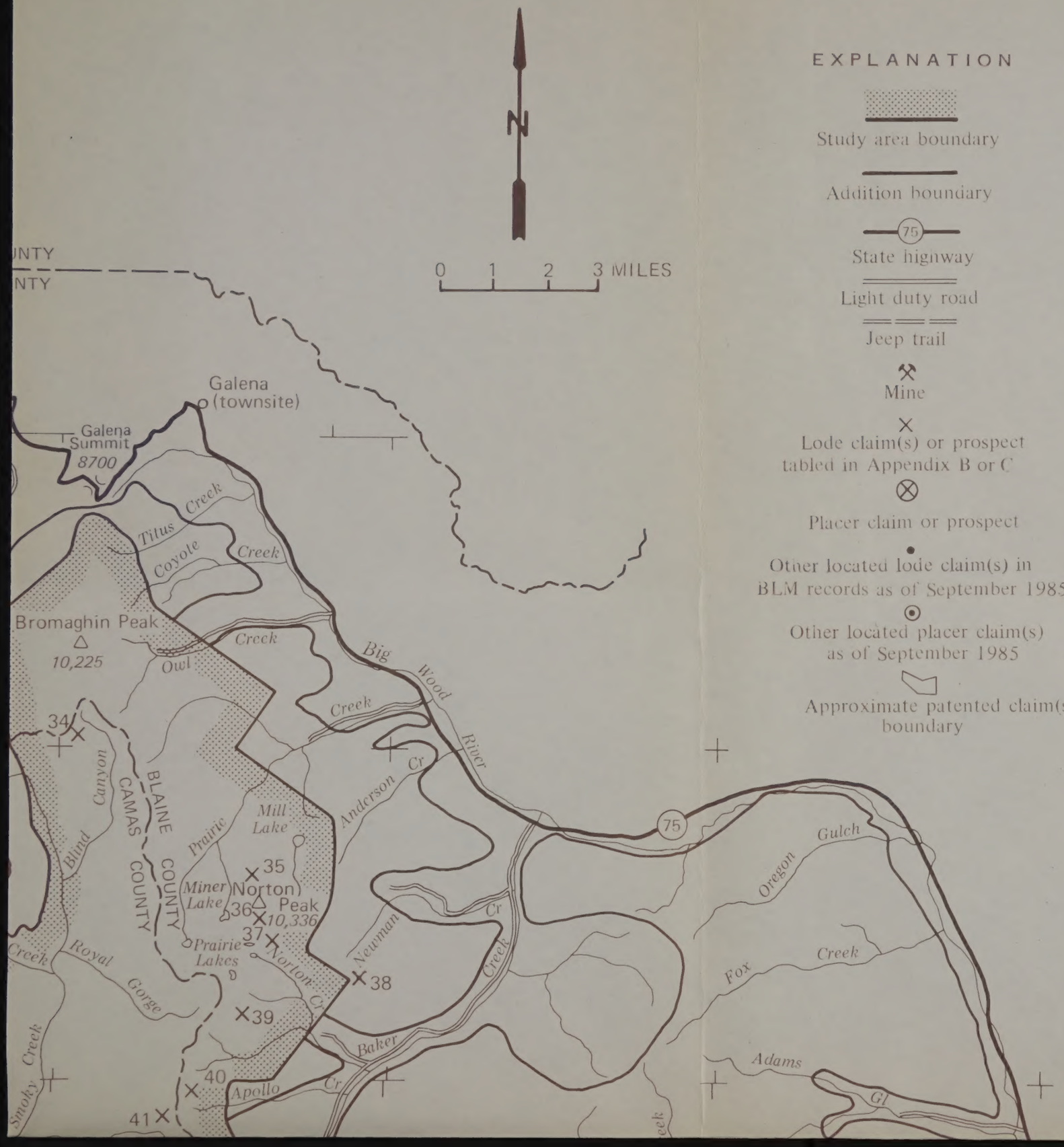

EXPLANATION

Study area boundary

Addition boundary

75
State highway

Light duty road

Jeep trail

Mine

×
Lode claim(s) or prospect
tabled in Appendix B or C

⊗
Placer claim or prospect

•
Other located lode claim(s) in
BLM records as of September 1985

⊙
Other located placer claim(s)
as of September 1985

Approximate patented claim(s)
boundary

Mines, prospects, and claims

Study area

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2. Pilot Knob prospect
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7. Ibex prospect
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16. Red Cloud prospect
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39. Unnamed prospect
40. Apollo Creek prospect
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42. Baker Peak prospect
43. Horseshoe prospect

North Addtion

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66. Chandler Western Reserve claim group
67. Goodhope prospect
68. E & D mine
69. Rabbit Foot prospect
70. Frenchie prospect
71. Salmon River prospect

Southwest Addition

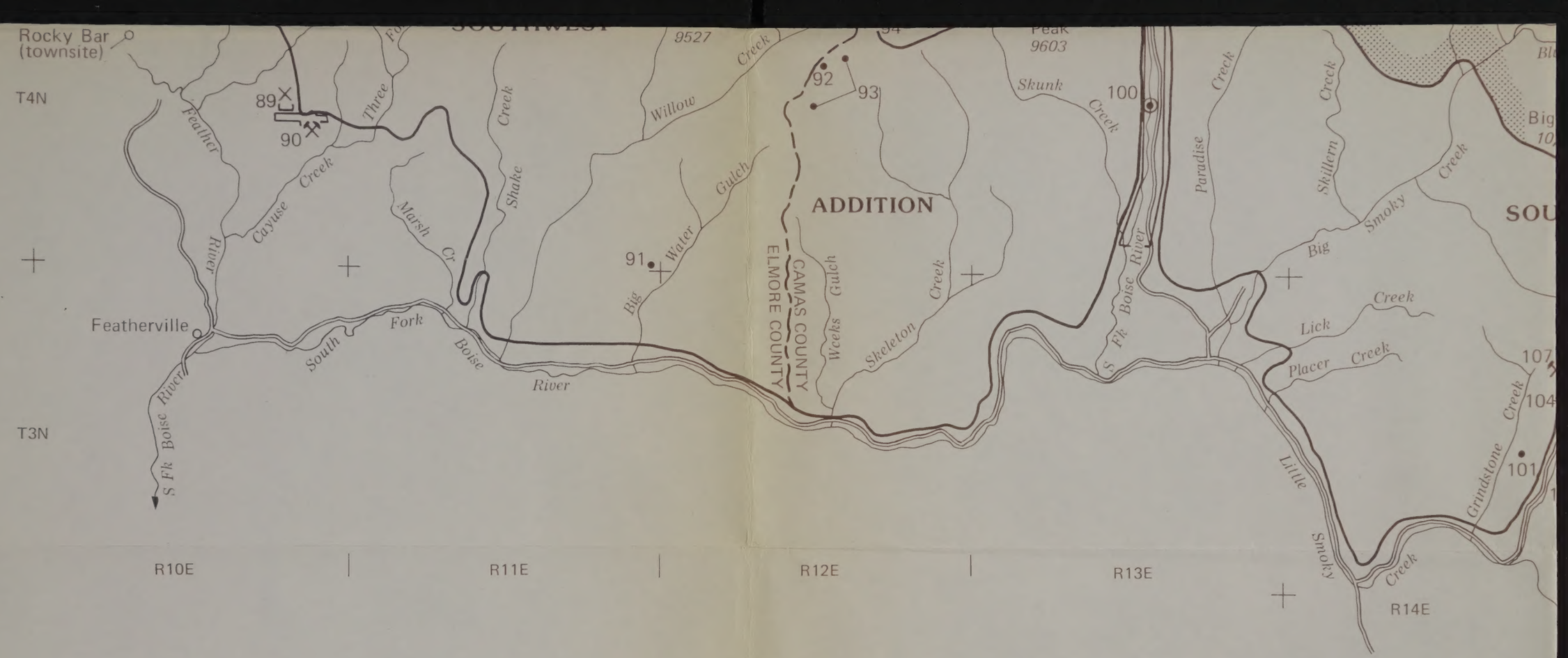
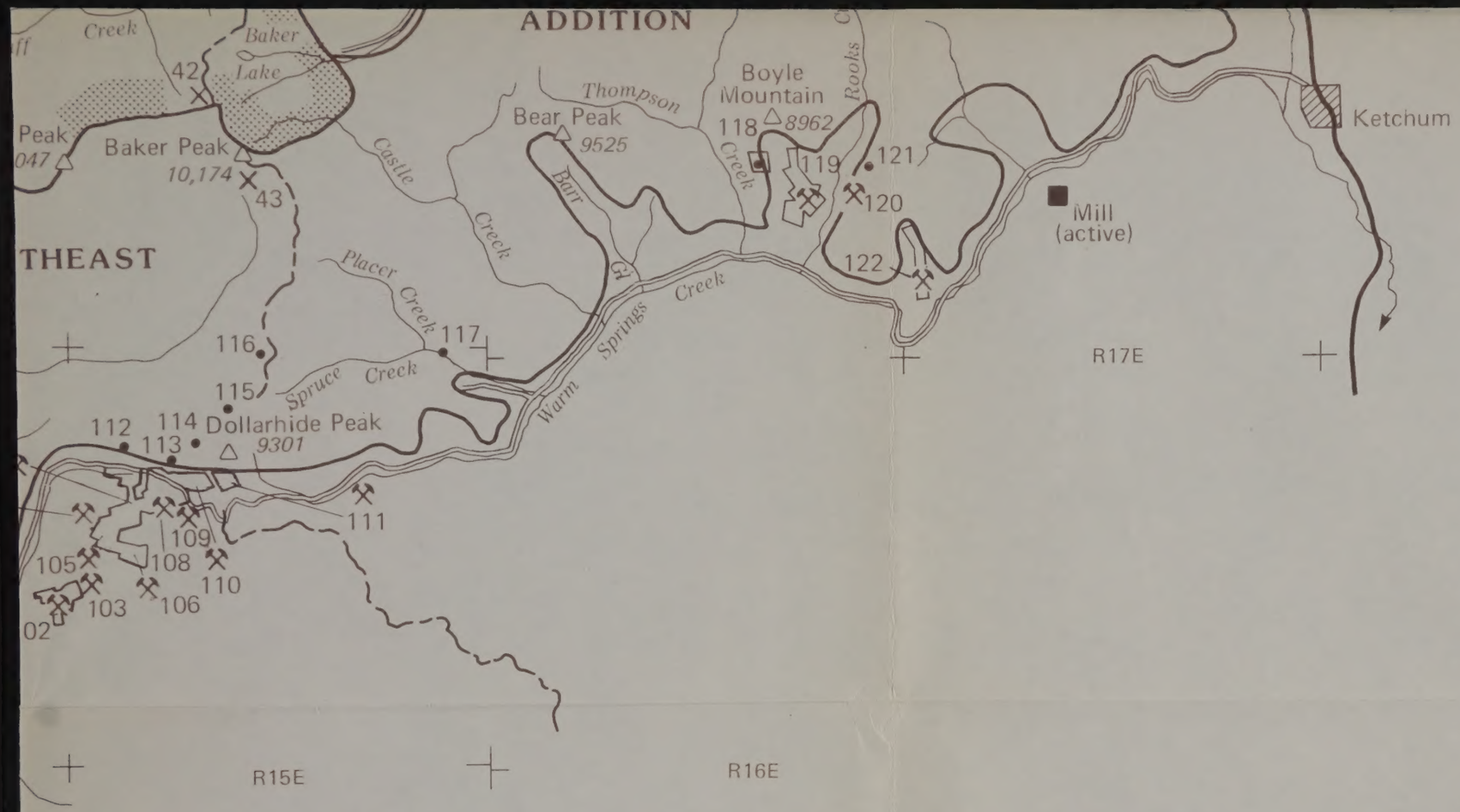


PLATE 1.— Mines, prospects, claims, and mineralized sites in and adjacent to the



South Boise Yuba study area and additions

73. Greenback mine
74. Atlanta lode mines (historic)
75. Atlanta Gold Mines prospect
76. Minerva mine
77. Camp Creek claim group
78. Golden Stinger claim
79. Pardner claim
80. Grouse Creek claim group
81. Decker claim group
82. Flint claim group
83. Polar Bear claim group
84. Good Chance claim group
85. Spanish Town mine
86. Golden Sunrise claim group
87. Lison mine
88. Ophir mine
89. Howard prospect
90. Bonaparte mine
91. Gold Ridge claim group
92. Spook claim group
93. Gold Mountain claim group
94. Red Horse mine
95. El Oro mine
96. Old Sam mine
97. Axoloti mine
98. Bear Creek placer claim group
99. Hazel B. placer claim
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Southeast Addition

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118. U and I claim group
119. Old Ontario mine
120. Lucky Boy mine
121. Pay claim group
122. Blue Kitten mine